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Editorial Notes

Coke for Motor Transport

THE report of the Committee on the Emergency Conversion of Motor Vehicles to Producer Gas, which we summarize in this issue, indicates the large amount of experimental work carried out since the appointment of the Committee in May of 1937. The membership of the Committee, which was set up at the special request of Viscount Caldecote, then Sir Thomas Inskip, Minister for Co-ordination of Defence, and presided over by Sir Harold Hartley, Chairman of the Fuel Research Board, is confined to representatives of the Fuel Research Board, the Department of Scientific and Industrial Research, the Ministry of Transport, the Mines Department, and six road transport operating companies. The Gas Industry, it will be noted, is not officially represented.

The work of the Committee was divided into two parts—(a) the design of a simple producer suitable for the conversion of existing vehicles and capable of rapid mass production at a minimum cost, and (b) extensive experiments at the Fuel Research Station on alternative fuels. The first part included much work on filtration methods, and in this direction the assistance of a gas undertaking was sought and freely given, with successful outcome. Though finality on the subject has not been reached, existing methods are, it is considered, sufficiently satisfactory for immediate application. Twenty-five firms have already decided on the manufacture of the equipment recommended by the Committee, which is designed for vehicles up to 6 tons laden weight, with engines up to 4 litres capacity. To assist rapid conversion, the Committee has also designed a trailer unit carrying the producer and its auxiliary gear. Enthusiasm has undoubtedly been created by the work and its possibilities, helped by the large amount of publicity which has been accorded it.

Regarding the second part of the programme, the staff of the Fuel Research Station carried out over 400 road tests, covering about 50,000 miles and using over 120 different fuels, including 40 types of anthracite or fuels derived from anthracite. They have been, and are still, very busy investigating the possibilities of preparing a suitable producer fuel in large quantities by carbonizing selected coals under special conditions in gas-works retorts. Hope is expressed as to the outcome of this work.

The main conclusion set out in the report of the Committee is that it is of the utmost importance that producers should not be used with unsuitable fuels, and that the only suitable fuels at present available are low-volatile anthracite and certain low temperature cokes. The position regarding the availability of fuel is that sufficient anthracite for several thousand vehicles could be made available at short notice, and that the addition to anthracite of low temperature coke, which should be possible without undue disturbance to existing markets provided certain plant were installed at low temperature works, should provide fuel for 10,000 vehicles. In a period of vital emergency, larger quantities of fuel could probably be diverted for use with producers. Finally, "there is reason to hope that the potential fuel supply *will be largely increased* by the addition of certain types of coke, should experiments fulfil their present promise." The italics are ours, and we assume that the experiments the Committee has in mind are those in progress at the Fuel Research Station.

What Is the Industry's Attitude?

BESIDES the Hartley Committee, there is now in being a Coal and Carbonization Industries Committee. This was appointed by the Mining Association after consultation with the Mines Department. The Chairman is Mr. Herman Lindars, who is also Chairman of the Council of the British Coal Utilization Research Association. Its functions are complementary to those of the Hartley Committee. It is concerned with the long-range problem of building up supplies of fuel "to enable the use of producer gas to be developed on a large scale without fear of shortage of supplies, and also with the more immediate problem of ensuring that the gas producer units now being placed on the market should be kept supplied with the right fuels." We set out the constitution of this Committee in the "JOURNAL" of Jan. 31 last. On it, Mr. R. W. Foot and Mr. W. Boon represent the London and Counties Coke Association, and it is fortunate that the Committee has thus the advantage of their advice. But it seems to us surprising that on a Committee such as this, presided over by one who is Chairman of a Research Association dealing with long term as well as short term research on solid fuels, the Research Organization of the Gas Industry—an Industry which produces annually something like 8,000,000 tons of smokeless solid fuel—should have no place.

We are constrained to ask again, as we asked in the "JOURNAL" of Jan. 31, what the Gas Industry's attitude is to investigation aiming at the development of fuels suitable for use in producer gas vehicles. And we feel that whatever this attitude is, the personnel of the Industry should be properly informed of it. The opinion of one or another gas undertaking is not the point. What we want is the expressed view of the Industry; and it seems to us that the proper mouthpiece on this particular matter is the Gas Research Board, which is concerned with both long term and short term research which surely embraces all the products of the Industry and not solely gas.

It may well be that the Coal Utilization Research Association, the Fuel Research Board, and Imperial Chemical

Industries are over-optimistic in regard to the results of work on producing carbonized fuels for use in producer gas driven vehicles. We have referred in particular to the investigation at the Fuel Research Station into the possibilities of preparing suitable producer fuel by carbonizing selected coals in gas-works retorts. To what extent is the Gas Industry interested in this?

Types of Fuel Needed

BOTH the Hartley Committee and the Lindars Committee have drawn up specifications laying down the characteristics of fuels which can be expected to work satisfactorily in producer gas units of approved types. These specifications are on similar lines, that of the Lindars Committee, however, being fuller and rather more exacting. It was given in the "JOURNAL" of Jan. 31. That of the Hartley Committee will be found on a later page of our issue to-day. Let us examine for a moment a few of the requirements of the specification of the Lindars Committee. Tar yield not to exceed 0·03%; size limit ¼ in. to ⅛ in. (with proportions defined); reactivity not more than 0·03 C.A.B. (carbonized fuels); ash not more than 6% (again, carbonized fuels). It would not, we think, be beyond the bounds of possibility for the Gas Industry to produce fuels complying with these requirements. If it can be done at the Fuel Research Station it can be carried out on a larger scale by the Gas Industry.

There are, of course, practical considerations not brought out by the specifications. There is, for example, the question not only of the quantity of ash, but whether the ash will give rise to clinker. Then there is the all-important question of bulk density. This varies from something like 50 lb. per cu.ft. for anthracite down to 19 or 20 lb. per cu.ft. for low temperature cokes; and the capacity of the fuel hopper of a producer is obviously dependent on the bulk density of the fuel used—in brief, the higher the bulk density, the better. These considerations are all-important in practice, quite apart from reactivity and ash and moisture contents.

To our minds, what it amounts to is this: Is it worth while for the Gas Industry to spend a great deal of time, money, and energy in prosecuting research in an attempt to make solid fuels suitable for producer gas traction when the Industry has alternatives available? Even under emergency conditions, would the prepared product be too costly compared with the alternatives? We are not going to attempt to answer these questions, but answer is needed.

Alternatives to Producer Gas

IT will be generally admitted that the producer gas system is at its best for long distance hauls. For short distance operation involving many stoppages it cannot compare in convenience and all-round efficiency with compressed gas, which has been the subject of detailed survey in these columns of late. Compressed gas for transport is a proved technical proposition; it is clean and reliable, and the fuel is there for the asking. And what about gas coke for steam driven vehicles? This field of usage for coke seems to have been somewhat forgotten amid all the research on producer gas fuel. The Gas Industry could supply an almost unlimited amount of solid smokeless fuel for use in the steam-driven road vehicle. The extended use of the steam lorry has been considerably handicapped in the past by the adverse effect of its weight on the amount of taxation and the restrictions imposed by the Road Traffic Acts. But circumstances have changed, and if the Government can make concessions in regard to the weight of vehicles carrying the necessary auxiliary equipment for producer gas there seems to be no valid reason for denying corresponding concessions to users of "steamers" which use home-produced fuels exclusively. The producer gas system and the compressed gas system meet the case for the conversion of existing vehicles, whereas steam vehicles have to be specially constructed. Under wartime conditions, however, the advantages of the steam driven vehicle assume far more importance than in times of peace. Re-fuelling presents no difficulty, for coke is obtainable from every gas-works and should be obtainable from every coal merchant's depôt in the country. It is thoroughly economic in operation, and the refinements which have been made in coke of recent years have removed any objections which it may have formerly encountered.

Smoke Abatement

WRITING in these columns shortly after the outbreak of war we said that though it was wise that the National Smoke Abatement Society should cut out all avoidable expenditure, it would be a thousand pities if those who had helped the organization to gather strength and, particularly in late years, to emerge into quite an important body influencing public opinion towards the best use of coal should entirely withhold their support. True national economy, we added, lies in the use of the valuable products which coal contains and will yield on carbonization. In the present circumstances more than ever should we regard the burning of raw coal in the domestic grate as national waste. Smoke abatement is important not only on its own account, but also in relation to other problems of national importance. Smoke is an indication of the partial, and therefore wasteful, combustion of bituminous coal, and the encouragement of smoke abatement is of direct assistance to measures for coal conservation and fuel economy which are to-day more essential than ever. Again, measures for the prevention of any smoke that could possibly assist aerial attack should be effectively undertaken.

We are glad that there has, in general, been an encouraging response to the appeal recently put forward by the N.S.A.S. for continued financial support, though a few of the larger subscribers have not seen their way to continue their help. Reforms which would interfere with the war effort may have to wait, but reforms such as smoke abatement, which are consonant with and directly assist immediate national requirements, have a double reason for receiving consideration during this emergency period. The Society has just issued a sound little booklet entitled "Smoke Abatement in Wartime"—brief, but very much to the point. In it attention is drawn to the fact that the solution of the domestic problem is parallel with and dependent upon the problem of using our coal reserves in the wisest and most productive manner. Our coal is too precious and too hardly won to be wasted either in time of peace or in time of war. "True conservation," it is remarked, "lies in using it to the fullest extent made possible by contemporary scientific knowledge, so that from the fuel is extracted either the maximum of heat and power value or the maximum of the chemical wealth it contains." When this is done, and it is in the national interest that it should be done to-day just as in time of peace, there will be no smoke. Encouragement should continue to be given towards a higher level of domestic fuel usage. The financial loss, the toll upon health and amenity, the general waste of labour, are useless burdens to the community, and they add to the heavier burdens which now have to be borne.

The abatement of the smoke nuisance should be persisted in. The movement had gained momentum. People were becoming smoke conscious—more conscious, perhaps, than the individual would readily admit. And now, are we going to slip back? According to the second wartime issue of *Smokeless Air*, the Journal of the National Smoke Abatement Society, there are already signs of slipping back. Increased industrial activity is not always being accompanied by due regard for fuel economy, and the control of nuisances by local authorities has in many areas been relaxed. The excuse offered—that munitions or armaments or some kind of work is being undertaken—ought not to be entertained. In some areas atmospheric pollution records are being continued, and

though, so far, no very rapid rise has been shown, the figures are definitely showing heavier pollution. This is a disconcerting fact, and it shows how desirable it is that atmospheric pollution observations should not be discontinued in wartime. In this campaign against unnecessary waste, in the plan of making the best use of coal, the Gas Industry—a great smokeless heat and chemical industry—has a major part to play and it must continue to exercise effort to make its claims understood, appreciated, and translated into practice. The more widespread the use of gas and coke, the better it will be for the health of the nation and for true national economy.

Factory Lighting

JOINTLY with the E.L.M.A. Lighting Service Bureau, the Electrical Development Association has issued a book on "Modern Factory Lighting," including special wartime requirements. This manual, as we mentioned in the "JOURNAL" of Jan. 24, is to be circulated to about 30,000 industrial establishments as one part of the activities of the Association in its campaign to increase the use of electricity—a campaign on a scale never heretofore attempted. The book is an excellent treatise on the subject, and it ought to be studied by the Gas Industry, for the approach is scientific and far from shallow and it fits in admirably with modern lighting requirements—that is, of course, modern electric lighting. It deals with the purpose of factory lighting and the legislation governing such lighting; with the choice of light sources and the design of interior lighting installations; with special industrial problems and, finally, with wartime control of factory lighting. It is, in fact, a most valuable text-book, well conceived and well executed. With the aid of photographs, diagrams, and charts it explains the productive value of good lighting and deals exhaustively with the subject of factory lighting design. In brief, it is first-class 1940 propaganda value, and the Gas Industry has, we suggest, a good deal to learn from it as regards both the contents and the idea which inspired the book's publication. "Modern Factory Lighting," by the way, is priced at 8s. 6d. to those who are not favoured with a presentation copy.

We think the policy of the Electrical Development Association in publishing such a book, and, in general, in "looking on the bright side," is a right and helpful one. The information set out is clearly expressed and of a nature to be of real practical value. The policy and its outcome does make us wonder whether we as an Industry have done enough in expounding technically the merits of gas as a source of light for factories, and whether, on the broader issue, as an Industry we are doing as much as we could to help the industrialist and the factory and workshop manager in wartime. As is pointed out in "Modern Factory Lighting," in peace time it is important to individual firms that their rate of production should be maintained at a high level without debasing the quality of the manufactures. In wartime it becomes a matter of vital national necessity to carry on accurate production at the highest possible rate for 24 hours a day, and to do this as economically as possible despite the various handicaps and difficulties inseparable from war. As we have emphasized before, the greater the use of gas the greater the production of raw materials essential to the prosecution of war. And as for economy, according to the degree of illumination afforded gas lighting can satisfy anything from 30% to 90% of the heating requirements of a factory. Let these facts be made more widely known.

I.G.E. and N.G.C. Annual Meetings

It is now announced that the Council of The Institution have decided provisionally to hold the 77th Annual General Meeting on June 4 and 5. Members are to receive official notification in due course, which will no doubt give an indication of what technical business it is proposed to transact. Wisely the National Gas Council are provisionally arranging to work in their 22nd Annual General Meeting at the same time—on the afternoon of June 5.

In these days when opportunities for exchange of views are fewer than normal, no doubt members will make every effort to keep these dates free for a journey to the Metropolis.

Au Clair de la Lune

Having, apparently, little confidence in the early progress of the new street lighting, the London and Southern District Junior Gas Association have fixed their next meeting for Feb. 23—this date having been selected for the first evening meeting "so that members may take advantage of the full moon." It is well known that the learned discussions of this eminent Association are by no means of the nature of moonshine, and "Some Aspects of Coal Testing," which is this month's subject for discussion, based on a study of coal tests with special reference to the Coal Survey of Great Britain, is no exception to their strict adherence to subjects which matter. The fact, however, that an Industry whose origin was the purveying of light in dark places should be reduced to wooing moonbeams is yet another strange commentary on the march of civilization.

Forthcoming Engagements

Feb.

15.—Gas Research Board.—Drafting Panel of Council, Gas Industry House, 11 a.m.

15.—Fuel Luncheon Club.—Connaught Rooms, 12.40 p.m. After Luncheon Address by Dr. Franz Kind.

16.—Chemical Engineering Group.—Meeting in Rooms of Chemical Society, Burlington House, W.1, 2.30 p.m. Paper by Mr. B. N. Reavell and Dr. G. E. Foxwell, on "The Chemical Plant Manufacturer in Relation to Chemical Industry."

16.—Southern Association (Eastern District).—Meeting at Gas Industry House, 11 a.m.

16.—I.G.E.—Liquor Effluents and Ammonia Committee, 2 p.m.

17.—Scottish Juniors.—Joint Meeting at Herriot-Watt College, Edinburgh; Address by W. D. Rowe, of the B.C.G.A.

20.—B.C.G.A.—Executive Committee, 10.45 a.m.; General Committee, 2.15 p.m.

20.—I.G.E.—Gas Education Executive Committee, 11 a.m.; Gas Education Committee, 2 p.m.

22.—Institute of Fuel.—Meeting at Burlington House, Piccadilly, W.1, 2.15 p.m. Paper by S. Thomson, "Modern Gas Storage."

23.—London and Southern Juniors.—Meeting at Gas Industry House, 7 p.m.; Paper by F. Duckworth (Tottenham), "Aspects of Coal Testing."

24.—Manchester and District Juniors.—Meeting at Manchester. Address by Sir Frederick West.

24.—Yorkshire Juniors.—Meeting at Bradford. Paper by S. H. Stokes (Elland), "Economic Utilization of Unscreened Coke Breeze."

29.—S.B.G.I.—Meeting of Emergency Committee, Crown Hotel, Banbury, 2 p.m.

March

1.—Gas Research Board.—Joint Committee on Complete Gasification under Pressure, 2.30 p.m.

5.—Gas Research Board.—Council Meeting, Gas Industry House, 2 p.m.

8.—B.C.G.A.—Annual Meeting of Members in Scotland, Central Station Hotel, Glasgow, 2.30 p.m.

11.—I.G.E.—Finance Committee, 1.45 p.m.; Membership Committee, 2.15 p.m.; General Purposes Committee, 3 p.m.

12.—I.G.E.—Council Meeting, 10 a.m.

13.—L.C.C.A. Coke Salesmen's Circle.—Meeting at Gas Industry House, 3 p.m.

14.—Gas Research Board.—Refractory Materials Joint Committee, 2.30 p.m.

15.—I.G.E.—Liquor Effluents and Ammonia Committee, 11.30 a.m.

15.—Gas Research Board.—Joint Research Committee, 2 p.m.

19.—I.G.E.—Gas Education Executive Committee, 2 p.m.

30.—Manchester and District Juniors.—Meeting at Bolton. Paper by N. Matthews, "Operations and Efficiency in Vertical Retorts."

April

19.—I.G.E.—Chairmen's Technical Committee, 2.30 p.m.

Letters to the Editor

Multi-Point Water Heating

SIR,—In the January, 1940, issue of the "GAS SALESMAN," page 18, under the title "Modern Multi-Point Water Heating, Recent Developments by Ewart," and in the Jan. 24, 1940, issue of the "GAS JOURNAL," page 181, under the same title, statements are made which are likely to create the impression that Messrs. Ewart are responsible for most of the pioneer work which we, we believe, are fully justified in claiming for ourselves.

It will not, I think, be disputed that it was the extensive research work carried out by my Company for many years to determine the fundamental principles for the design and construction of multi-point water heaters that made it possible for Ascot Gas Water Heaters, Ltd., to popularize this type of appliance, and place it securely on the map.

Incidentally, in the short write-up to which this letter refers, it was stated that Messrs. Ewart "claim to be the originators of the multi-point heater." To the best of my knowledge it was Righton, in 1888, who first designed and constructed an automatic valve for multi-point heaters, whereby the opening of the gas valve was controlled by the flow of water (see "Science and Practice of Gas Supply," by Arthur Coe, Volume 3, page 1,627).

The real purpose, however, of this letter is to call attention to statements which, as I have indicated, are likely to give rise to wrong conclusions which may be prejudicial to my Company, and it is for this reason I am compelled to ask you to allow me to correct these statements.

Twelve years ago I first introduced to this country a type of gas water heater which has now very largely superseded and replaced the older type of machine. When I first exhibited the "Ascot" heater it was acclaimed by gas engineers as original, novel, and revolutionary. Since then "Ascot" gas water heaters have been closely followed and copied by other makers. Imitation may be a sincere form of flattery, but, it must be added, it has very little intrinsic value.

I hope I may be allowed to call attention to the following points to substantiate what I have said:

(1) The feature that the "Ewart" heater "can, in fact, be taken to pieces and reassembled *in situ*, without disturbing the baffler or breaking the vent pipe," is not original. This feature was first introduced by Ascot, and has been described in our publication "Notes Relating to the Physics and Chemistry of Heating Water by Gas-Fired Appliances," 1st Edition, February, 1932.

(2) The pilot safety device was introduced by Ascot in 1933 (see "Fundamental Principles of Water Heating for Domestic Use," by Dr. Bernard Friedman, 1st Edition, November, 1934, page 19, point 9; also "Practical Aspects of Instantaneous Water Heating by Gas," by Leopold Friedman, in the "GAS JOURNAL," Jan. 1, 1936, page 40).

(3) The "constant gas governor" is a somewhat ambiguous term, but it is probably meant to refer either to a constant volume, or a constant pressure, governor. The constant volume gas governor was first introduced as an integral component of the "Ascot" heater, and was described in the "GAS JOURNAL" of August 5, 1936, page 331, "Governors for Instantaneous Gas Water Heaters," by Leopold Friedman.

(4) There is obvious confusion in reference to a "water throttle (or water temperature selector as it is sometimes called)." The use of a water throttle goes back a very long way. I used it 25 years ago, and it has been fitted to all "Ascot" appliances since their introduction. The water temperature selector, as first named by my Company in their literature, is something altogether different from a water throttle. The temperature selector was introduced by my Company in 1936, and was exhibited at the British Industries Fair in that year. Details of the temperature selector were given in the "GAS JOURNAL" of July 27, 1938, page 245.

Yours, &c.,
BERNARD FRIEDMAN,
Managing Director.

Ascot Gas Water Heaters, Ltd.,
Neasden, N.W.10.
Feb. 8, 1940.

The Coal Industry

In the letter by Mr. J. P. Dickie in last week's issue we greatly regret that owing to a printer's error the opening of the penultimate paragraph read incorrectly. It should, in fact, have read as follows: "Coal is the foundation of our whole industrial system, and it is essential that it should be available at the lowest possible economic figure. A 'cheap and abundant' supply . . . ."

Shortly after going to press we have received a reply to the above letter by Dr. G. E. Foxwell which must unavoidably be held over until next week's issue.—Ed. "G. J."

Personal

The President of the Board of Trade has appointed Colonel ALAN STEIN, M.C., Director of John G. Stein & Co., Ltd., firebrick manufacturers, of Bonnybridge, to be a member of the Price Regulation Committee set up under the Prices of Goods Act (1939) for the South-Western district of Scotland.

* * *

To fill the vacancy occasioned by the death of Mr. Charles Chambers, Mr. C. M. CROFT, D.L., J.P., Chief Engineer and General Manager of the Wandsworth and District Gas Company, has been appointed to the Board of Directors of the Watford and St. Albans Gas Company.

Obituary

Mr. JEREMIAH GRANT, formerly Manager of the gas-works at Tipperary, Cork, Waterford, Kilkenny, and Fermoy, has died. He retired in 1923.

Conjoint Conference of Public Utility Associations

Annual Meeting

At the Annual Meeting of the Conjoint Conference of Public Utility Associations held in London recently, Mr. W. B. Woodhouse, Managing Director of the Yorkshire Electric Power Company, was again elected Chairman in succession of Sir Albert Atkey, of Nottingham, who represented the water undertakings. This is the ninth occasion in the last twelve years that Mr. Woodhouse has been elected Chairman. It was the turn this year of the Gas Industry to make a nomination, and they nominated Mr. Woodhouse.

Acknowledging the compliment paid him by the representatives of the Gas Industry, Mr. Woodhouse said it indicated the broad view adopted by that Industry, and their willingness at all times to co-operate with the electricity and water undertakings in matters of common interest. All these utilities had vital obligations to the public, and many of the legislative and other problems which affected one affected the others; hence the desirability of common action and joint representation to the Government Departments, or other interests concerned. This co-operation was appreciated by the Government and other bodies, and the fact that the capital expenditure of the interests represented exceeded one thousand million pounds sterling was sufficient indication of the importance of these undertakings in the life of the country.

Their joint association in no way interfered with a healthy and friendly competition between the electricity supply industry and the Gas Industry, which assured consumers and potential consumers of the best service, and all the benefits of progress which competition brought. If any additional assurance were needed it was to be found in the fact that the Conjoint Conference contained representatives of practically all municipal and company undertakings. The Conjoint Conference carried out unobtrusively a valuable public work, and one of the utmost importance to the public utilities of the country.

The annual report of the Conference indicated the wide scope of the subjects considered by the Council and by the Coal, Rating and Valuation, and Mains and Cables Committees. Since the outbreak of war representatives of the Conference had been able to take action in the interest of the members, and although no Bill of major importance among peace-time measures reached the Statute Book, a number of Bills was considered and representations made upon them.

Long experience of collaboration made it possible for a Joint Committee of Electricity and Gas representatives to consider the Fuel and Lighting Order, and an early result of their action was the modification of the Order and its subsequent withdrawal.

Following discussions between representatives of the Highways Authorities and the Conjoint Conference and the Government over a long period of years, the Government decided to set up a Joint Committee of both Houses of Parliament to deal with the question of mains and cables in highways. Evidence was given on behalf of the Conjoint Conference before this Committee. The contentions of the Conjoint Conference were approved by the Joint Committee, and the report which was subsequently issued laid down the principle that the incidence of liability for the cost of removing sub-service works should be borne by the party which initiated the proposal to effect an alteration of the highway which necessitated the removal or alteration of the apparatus, and so entailed the cost.

News of the Week

The Gas Industry was the subject of an address given last week by Mr. J. H. Ranft (Engineer and Manager of the Lytham St. Annes Gas Department) to the local Baptist Church Men's Fellowship.

The Annual Meeting of members of the British Commercial Gas Association in Scotland, which was to have been held on Feb. 16, has been postponed and will now take place at the Central Station Hotel, Glasgow, at 2.30 p.m., on Friday, March 9.

Notice has been given by the Cefn Mawr and Rhos-y Medre Gas Company that as from the date of meter reading at the end of January, 1940, the price of gas to ordinary and industrial consumers will be increased by 6d. per 1,000 cu.ft. In the case of prepayment consumers, the alteration will be effected by reducing the present rate of discount to 1s. 5d. in the £.

The Government of Northern Ireland, through the Ministry of Finance (Board of Works), have placed an order with Radiation, Ltd., for ten No. 210 M Multi-point water heaters for use in Royal Ulster Constabulary Police Barracks in Belfast and district. Each of these heaters is being connected up to two shower baths for personal decontamination purposes when the police are engaged on A.R.P. work.

Coke Oven Gas from Workington is to be supplied to two new factories in West Cumberland—one proposed and one in course of erection—if the Workington Town Council gives its sanction. The Coke Oven Gas Sub-Committee are considering applications from Cockermouth in respect of a supply to a proposed factory to be erected at Bridgefoot by Nestle, Ltd., and from Ennerdale in respect of a supply to a new works at Distington.

A Revision of BS/ARP/1 (heavy aggregates for shelters constructed *in situ*) has just been issued by the British Standards Institution. The scope of the standard has been extended and it now includes three sections—for natural aggregates, blast furnace slag, and crushed brick and tile respectively. The general requirements for all the three sections are specified by direct reference to B.S.882, "Natural Aggregates up to 1½ in. Nominal Maximum Size for Concrete for Structural Purposes Including Roads," which has also just been published. Special requirements are included for both the blast furnace slag and also for crushed brick and tile. Copies of this revised Specification can be had from the British Standards Institute, 28, Victoria Street, London, S.W.1, price 2d. (3d. post free).

Sanction to Borrow the sum of approximately £2,000 has been granted to the Bethesda Gas Department for the purpose of renewals at the gas-works. Work in connexion with the re-sheeting of the gasholder is already in hand.

A Joint Meeting of the Scottish Junior Gas Association will be held at the Herriot-Watt College, Edinburgh, on Saturday, Feb. 17, at 3 p.m. The speaker at this meeting will be Mr. W. D. Rowe, of the British Commercial Gas Association, and he will give an address on the work of the Association.

An Increase in the Maximum Price which the Corporation may charge for gas supplied by them or to fix a new maximum price is the principal provision of a Special Order for which the County Borough of Bolton intend to apply to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934.

The Special Order of the Cefn Mawr and Rhos-y-Medre Gas Company, Ltd., under the Gas Undertakings Acts, 1920-1934, has been presented to both Houses of Parliament for approval. The Order is based upon normal practice, and seeks to make the usual provisions regarding the financial and general operations of the Company.

Aspects of Coal Testing will be the subject of a paper to be read by Mr. F. Duckworth, B.Sc., A.I.C., of the Tottenham & District Gas Company, to the London & Southern District Junior Gas Association on Friday, Feb. 23. The meeting will be held at Gas Industry House at 7 p.m., and will be open to all interested in coal and coal testing.

For the Laying of a 24-in. diameter coke oven gas main from Grangetown to the gas-works at Middlesbrough the Middlesbrough Town Council have accepted the tender of Jeavons & Co., Ltd., of Tipton, at £10,976. The tender of W. C. Holmes & Co., Ltd., of Huddersfield, at £1,410, has been accepted for the supply of a station meter in connexion with the new coke oven gas supply.

The Month of January broke all records for Lincoln's gas output, this, at 96,469,000 cu.ft. showing an increase over the corresponding month of last year of 12,043,000 cu.ft. The previous highest monthly figure was 84,426,000 cu.ft. The highest day's output was on Jan. 15—3,544,000 cu.ft. compared with previous highest on Dec. 20, 1938, of 3,253,000 cu.ft. The total increase for past ten months is over 32 millions. The normal street lighting load is 37 millions.

Glasgow Cookery Demonstrations

Our photograph gives a view of the Central Showrooms where the Glasgow Corporation Gas Department opened the first of a series of Wartime Cookery Demonstrations on Feb. 5. These demonstrations continued all the week in the Central Showrooms and this week are being held in the Department's Queen's Park Showrooms in Victoria Road. The demonstrations are given by Miss Hambly of Radiation, Ltd. During her demonstrations Miss Hambly also gave a few Home Gardening Hints, which were greatly appreciated by those present. The cookery recipes proved that even in wartime many dainty and appetising dishes can be served at very little cost to the housewife. The demonstrations were excellently attended, and the dishes prepared were on sale at the conclusion of each session.

Institution of Gas Engineers

Copies of the following recently published British Standard Specifications can be obtained on application to the Secretary, The Institution of Gas Engineers, 1, Grosvenor Place, London, S.W.1.

BS/ARP 1.—Heavy aggregates for shelters constructed *in situ*. (January, 1940.) Superseding BS/ARP 1, July, 1939. Price 3d. each.

BS/ARP 37.—Street lighting under war-time conditions. (January, 1940.) Superseding BS/ARP 37, December, 1939. Price 8d. each.

BS/ARP 26.—A reduced scheme for the lighting of shelters, where a.c. mains are available. (January, 1940.) Price 3d. each.

BS/ARP 30.—Checking low values of illumination. (January, 1940.) Price 3d. each.

Nos. 885—1940, 886—1940, Seamless Brass Tubes for General purposes.

885.—Hard Drawn Seamless Brass Tubes. (Ultimate Tensile Stress 25 to 35 tons per sq.in.)

886.—Annealed Seamless Brass Tubes.

Southern Association

(Eastern District)

The next meeting of the Eastern District of the Southern Association of Gas Engineers and Managers will be held at Gas Industry House on Friday, Feb. 16, at 11 a.m., when the following subjects will be discussed: Markets under war conditions; war-time experience of fractured gas mains and repairs to mains after fire or explosion; sales policy during war; absorption of female labour into the Gas Industry; and allowances to employees with the Forces.

Glasgow and Coke Oven Gas

Policy to be Reconsidered

Glasgow Corporation is likely to reconsider at an early date its policy in declining to use surplus coke oven gas from local iron and steel works. The Corporation is at present negotiating with Messrs. William Dixon, Ltd., for a supply of coke oven gas. Messrs. Dixon have offered to supply approximately 5 million cu.ft. daily from their Govan Iron Works at Polmadie, and the cost, after purification and other expenses, is stated to be half the cost required to produce the same amount at the Glasgow gas-works.

The Glasgow Gas Committee agreed on Feb. 9 that their Convener, sub-Convener, and Mr. J. W. McLusky (Gas Engineer and General Manager) should meet representatives of Messrs. Dixon with a view to adjusting terms of agreement. The Gas Committee desire a binding contract for a period of three or five years, while Messrs. Dixon have indicated that in the present abnormal conditions they cannot bind themselves for any period but are willing to give reasonable notice if conditions should force them to stop the supply.

Following a preliminary conference with members of the Gas Committee, held on Dec. 20, 1939, Messrs. Dixon offered to supply 5 million cu.ft. of gas daily on a sliding-scale price to be determined by the cost of coal, that price, in December last, to be 5½d. per 1,000 cu.ft. At the present pithead price of coal the cost of the gas would be 6d. per 1,000 cu.ft. The scale provides for an increase or a reduction of one-eighth of a penny for every shilling of difference in the price of coal. The Company will instal plant at their works to deliver the gas into the mains at the required pressure, this plant to include a gasholder of 100,000 cu.ft. capacity. They will also supply the Corporation Chemical Works with a quantity of crude tar to balance the drop in production resulting in reduced throughput in the municipal plant. The Gas Committee are anxious to maintain the supply of other by-products, especially sulphate of ammonia, and this point is to be discussed.

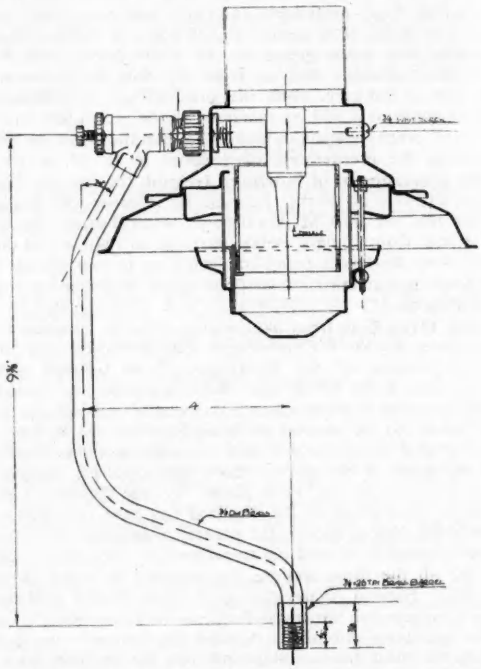
Messrs. Dixon have intimated that if circumstances arose which compelled them to discontinue the supply they would give such notice as would allow time for the heating up of the necessary plant at the Corporation Gas-Works, and they would also make available to the Corporation, if required, an equivalent amount of coking coal at market price for a period to be mutually arranged.

Mr. J. W. McLusky favours acceptance of the offer of coke oven gas, and in a report to the Gas Committee points out that it would allow the Department to maintain supplies during a very difficult and uncertain period. The maximum demand next winter each day may be 40 million cu.ft. and the maximum delivery this winter has been 37,112,000 cu.ft. The maximum productive capacity of 37 millions from municipal plant cannot be maintained unless reconstruction is carried out at Provan. Mr. McLusky states that the total cost of the coke oven gas, including purification and transmission charges, will be 7¼d. per 1,000 cu.ft. compared with a production cost of 1s. 6d. at the municipal gas-works.

Modified Street Lighting Units

The accompanying illustration shows a conversion unit for square lanterns, manufactured by Messrs. W. Parkinson & Co., in accordance with the British Standard Specification ARP/37, and in compliance with Ministry of Home Security regulations for street lighting during wartime.

It incorporates a shielded bijou mantle (875 B.Th.U. per hour) with special masks for the three recognized mounting heights.



Around the rim of the top shade is stencilled the mark of the British Standards Institution, without which these fittings must not be marketed or installed, and a certification that the licence to manufacture has been granted.

This unit, without the mask, resembles in many ways the Parkinson 0.002 fitting for docks, harbours, &c., in accordance with B.S./ARP/16, and intended for the conversion of square lanterns. It is also of the approved design adhered to by all gas lamp manufacturers.

Gas Undertaking Results

Cardiff

The accounts of the Cardiff Gas Light and Coke Company for the past year show that the quantity of gas sold to private consumers was 8,099,608 therms, which compares with 7,854,342 therms in 1938. On the other hand, public lighting and under contracts, no doubt as the result of war conditions, figure at £4,509, as against £6,920. The cost of coal and oil, including all charges, is up about £13,000, but the total expenditure on Revenue Account is within £400 of the previous year's figure. The sum included for employees' co-partnership is £4,074. On the present occasion, the balance carried to profit and loss account is £57,657, compared with £53,082 a year ago. An interim dividend has been paid on the consolidated ordinary stock of 3%, and the distribution recommended by the Directors for the past six months is £2 13s.%. The payment for 1938 was 6%. Rising costs and circumstances tending to restrict the use of gas in certain directions have compelled the Directors to increase the price by 1d. per therm from the December quarter meter readings.

Commercial

The Directors of the Commercial Gas Company (an account of the proceedings at whose annual meeting will appear in the next issue of the "JOURNAL") report, in submitting the accounts for the year ended Dec. 31, that the Revenue Account shows a profit for the twelve months of £110,284. The interim dividend was 2% on the ordinary stock, and the 1% now recommended will make a total for the year of 3%. For 1938 the Revenue Account showed a profit of £120,579, and the interim and final dividends were 2½% and 2% respectively—making 4½% for the year. To do this, however, necessitated a transfer of £4,668 from the Reserve Fund. Payment of the 1% for the past six months will leave to be carried forward the sum of £7,085. The quantity of gas sold in the past year was 14,038,875 therms, which compares with 15,064,895 therms in 1938. It was found necessary to increase the price of gas by 0.3d. per therm, to 10d. per therm, as from last Lady Day quarter, and to 12.5d. per therm as from Nov. 8. A Bill in Parliament has been deposited to confer further powers upon the Company.

Croydon

The report of the Directors of the Croydon Gas Company states that the sale of gas during the year shows a decrease of just over 3% as compared with the year 1938. The cost of coal was higher during the year, and consequent upon further increases both in labour and materials, the Directors have found it necessary to raise the price of gas from the beginning of the year 1940 from 9.1d. to 11.2d. per therm. Mr. W. J. Sandeman, who has been with the Company for over thirty-five years, during the past twelve of which he has been General Manager, retired on Dec. 31 last, and in view of his valuable experience the Directors have, under the powers of the Croydon Gas Order, 1926, appointed him to a seat on the Board. They desire to place on record their great appreciation of his services. Mr. W. Grogono, the Company's Engineer, has been appointed Engineer and General Manager. The accounts show that after deducting dividends for the half-year ended June 30, 1939 (at the rates per annum of 4% on the preference stock, 5% on the maximum dividend stock, and 7% on the sliding-scale stock), providing for all fixed charges, appropriating

£3,400 to the pension fund and £2,000 to the renewal fund, there remains for division, including the sum of £55,618 2s. 3d. brought forward from 1938, a balance of £100,617 13s. 4d.; and the Directors recommend that dividends be declared for the half-year to Dec. 31, 1939, at the following rates per cent. per annum, less income-tax: On the preference stock, 4%; on the maximum dividend stock, 5%; and on the sliding-scale stock, 7%. This will absorb the sum of £47,379 7s., leaving a balance of £53,238 6s. 4d. to be carried forward to the next account. The General Meeting of the Company will be fully reported in next week's "JOURNAL."

Derby

During the past year there has again been a considerable increase in the number of consumers of the Derby Gas Light and Coke Company; the total number being now 67,286. There has also been some increase in the quantity of gas sold, which was 2,014,343,900 cu.ft., as compared with 1,961,306,200 cu.ft. in 1938. The gain would have been greater but for the fall in the consumption for public lighting, from 26,450,800 cu.ft. to 14,079,000 cu.ft. The balance of revenue carried to profit and loss account is £62,483, as against £63,072, a year ago. While the cost of coal was about £2,500 more, receipts from residuals were very nearly this amount less. There is a balance at debit of capital account amounting to £115,710, while the reserve fund account stands at £122,138. With the final distribution recommended by the Directors, the dividend on the ordinary stock will be 7½% for the year. This is the same as was paid for 1938.

East Hull

Hull suffered from evacuation, and the East Hull Gas Company have to report a reduction during 1939 of 6.86% in the consumption of gas. To meet increased costs of production and special precautions now necessary for the protection of plant, the price of gas was raised 2d. per therm as from November last. The quantity of gas sold to private consumers was 476,775,600 cu.ft., compared with 484,137,800 cu.ft. in the preceding year, while the consumption for public lighting fell from 77,344,000 cu.ft. to 46,933,700 cu.ft. The balance of revenue carried to profit and loss account is £22,210, which compares with £17,139 a year ago. There is also a credit balance of £1,676 on the income tax account. The dividend for the past six months is £2 4s. 3d.% on the ordinary stock. The Directors point out that, in consequence of the rate of income tax having been increased to 7s. in the pound, the rate of the final dividend on the ordinary stock had to be reduced from the usual £2 10s.% to £2 4s. 3d.% to cover the insufficient deduction of income tax when paying the interim dividend—thus making the actual dividend for the year 5%. There will be a balance of £878 to be carried forward. The Directors refer to the serious loss to the Company by the sudden and unexpected death of the Engineer and General Manager, Mr. Richard Nelson, in November last, and express their confidence that the new Manager (Mr. T. W. T. Hammerton), who has been Secretary of the Company for many years, and the new Engineer (Mr. Bernard Stonham), who served for some years as Assistant Engineer under Mr. Nelson, will continue to carry on the business of the Company efficiently.

(We regret that in our Stock Market Report last week the total dividend for the year was incorrectly stated as £4 14s. 3d.%.)

Newmarket

The profit earned during the year 1939 by the Newmarket Gas Company was £3,175, which compares with £4,265 for the preceding year. After payment of the same dividend as before upon the original consolidated stock—namely, at the rate of 8½% for the year—there will remain to be carried forward to the next accounts the sum of £10,735, which is just about £700 less than the amount brought in. There is a balance of £3,962 at credit of Capital Account, the same as a year ago. Sales of gas and rentals of meters and stoves are about £40 up, at £15,278.

Newcastle-upon-Tyne and Gateshead

At the annual meeting of the Newcastle-upon-Tyne and Gateshead Gas Company (an extended report of the proceedings at which will be given in next week's issue of the "JOURNAL"), the Directors will report that there has been a considerable increase in the sale of gas for industrial purposes, but as from the start of the war the entire public lighting and a large quantity of domestic consumption have been lost, an increase of 9.9% at June 30 was reduced to one of 2.55% for the whole year. For the year the sales of gas per meter were 35,672,793 therms, and for public lighting 1,393,285 therms—making a total of 37,066,078 therms. A year ago the total was 36,145,317 therms. The difficult conditions necessitated an increase in the price of gas as from the June reading of the meters by 0.2d. per therm, and from the December readings by 0.4d. per therm. The profit for the year is £197,457, which compares with £199,928 for 1938. The dividend on the ordinary stock is £5 1s. 9d.% for the year, as against £5 7s. 6d.% for the preceding year. The carry-forward on this occasion will be £73,457, which compares with the sum of £79,206 a year ago. A Parliamentary Bill has been deposited for the absorption by the Company of the Morpeth Gas Light Company (1902), Ltd., to extend the Company's area of supply, and to schedule land for the storage of gas.

South Metropolitan

The Directors of South Metropolitan Gas Company will recommend at the forthcoming Annual General Meeting a final dividend of 2% actual, less tax, on the ordinary stock, making with the interim dividend of 2½% paid in September last, 4½% for the year ended Dec. 31, 1939. The balance applicable to final ordinary dividend at £161,954 13s. compares with £218,242 4s. 1d. last year.

The above distribution of 4½% for the year compares with 5½% paid last year. A full review of the accounts will appear in a later issue.

South Suburban

The Directors of the South Suburban Gas Company report that gas sales during 1939 at 26,239,614 therms show a reduction of 5½% in comparison with the previous year. Additional consumers connected during the year number 1,731. The Company, it is observed, have been involved in heavy expenditure during the year in connexion with Civil Defence measures. The Directors report that it became necessary to increase the price of gas by 2½d. per therm from the first reading of meters on and after Nov. 4 last. The balance of net revenue carried to profit and loss account is £178,725 9s. 11d., and after payment of fixed charges and interim dividend the amount available for ordinary dividend is £44,503 2s. 7d. The Directors recommend payment of a dividend for the second half-year of 1½% on the ordinary stock, less income-tax, making the dividend for the year 4½%, and leaving the sum of £21,346 4s. 1d. to be carried forward to the next account. This compares with £27,090 10s. 5d. brought in. The Directors regret that it is necessary to reduce the dividend for the year to 4½%, which renders impossible the payment of a bonus to co-partners. A Bill to confer further powers upon the Company is pending in Parliament and will be submitted for approval at an Extraordinary General Meeting following the Ordinary General Meeting to be held on Feb. 15, which will be fully reported in the "JOURNAL" next week.

Wandsworth

The accounts of the Wandsworth and District Gas Company for 1939 show a decrease of 3.9% in the quantity of gas sold to consumers, as compared with the sales of the preceding twelve months. This is due to evacuation from parts of the Company's area, and to other circumstances resulting from the war. The number of consumers has increased by 3,026, while the total sales of stoves and other major appliances during the year was 24,841. In 1938 the number of consumers increased by 6,141, and the sales of stoves and other major appliances totalled 31,437. The price of gas was increased as from the first meter reading after March 31, 1939, by 0.4d. per therm, and by 2.5d. per therm from a special reading of the meters after Nov. 7 last. In consequence of this, the receipts for gas totalled £1,161,561, as compared with £1,142,243 in 1938. On the other hand, the cost of coal (including all expenses of depositing on works) was £509,112, against £485,080. Actually, there was some increase in consumption in the past year in three of the districts comprised in the Company's area—Epsom, Leatherhead, and Walton. The dividend for the year is 5% on the consolidated stock, a reduction of 2% on the payment in 1938.

There is transferred to the Reserve Fund the sum of £10,283, and a similar sum is allocated to the employee co-partners. The amount left to be carried forward will be £20,333. The balance of Revenue Account, which remained to be carried to profit and loss on the present occasion was £284,901, which compares with £298,188 a year ago.

The meeting will be fully reported in next week's "JOURNAL."

Weymouth

The Directors of the Weymouth Consumers Gas Company are able to report that sales of gas were practically the same last year as in 1938, the very slight difference being on the right side. Actually, the sales totalled 1,432,306 therms, as compared with 1,427,683 therms in 1938. The Directors have so far avoided any increase in the price of gas, but they say that, with costs increasing in every direction, it is very doubtful if the present low price can be maintained. The balance at credit of Revenue Account is £6,980 (against £8,766 a year ago), which shows for the first time for many years a decreased profit. However, with the substantial reserves at the disposal of the Directors, they are again able to recommend the payment of the usual dividend of 6% per annum on the ordinary stock. Coal cost considerably more in the past year, and in the aggregate (with a smaller allocation to repairs and maintenance) expenditure under the heading of manufacture of gas is up by over £1,000.

Gas Light and Coke Company's Accounts

Working under War-time Conditions

WHILE every gas undertaking in the country is in the shadow of the same cloud, circumstances have not affected them all in the same way, at any rate during the last four months of 1939. The earlier part of the year, like 1938, had been a difficult period for the Industry as a whole, inasmuch as "coming events cast their shadows before." Rising costs and difficult business conditions had been making their mark throughout. But September brought vast movements of population—movements on a larger scale, probably, than history had ever before recorded—and from this point onwards, "there was a difference." Increasing costs continued to affect all alike, but as large sections of the population moved from one place to another, so did demands for gas vary. The result is that, along with reports of unaccustomed decreases from some quarters, there comes news of record outputs from others.

London, of course, has had to suffer every disadvantage, and it is in this light that the reports and accounts of the great Metropolitan Gas Companies must be considered. Sooner or later the people will return, war-time restrictions will disappear, shopkeepers will resume business on a normal scale, and commodity costs will descend to reasonable levels.

Meanwhile, at the Annual General Meeting to-morrow the proprietors will be asked by the Board of the Gas Light and Coke Company to agree to a dividend on the ordinary stock for the December half-year at the rate of £3 8s.% per annum, making, with the dividend for the June half at the rate of £5 12s.% per annum, a dividend of 4½% for the year 1939. The Directors state that, after the payment of the June half-year dividends on the preference, maximum, and ordinary stocks, and after contributing the sum of £20,000 to the Redemption Fund and the sum due to the co-partners for the year under the provisions of the Company's Act of 1931, there is a total available balance for the present dividends of £516,752, after bringing in £25,210 from reserve fund account. For 1938 the dividend on the ordinary stock was at the rate of £5 12s.% per annum, with a carry-forward of £53,598.

Proprietors will share with the Directors their deep regret at the serious loss of life which took place as the result of the sinking by enemy action of two of the Company's steamers, the "Torchbearer" and the "Whitemantle." No fewer than 2,000 of the Company's employees of all ranks are now serving with H.M. Forces.

The Directors place on record their regret at the recent death after a long illness of Sir Francis Goodenough, C.B.E., formerly Controller of Gas Sales, who retired in 1931, after being in charge of the Gas Sales Department for 28 years.

Some Comparisons

As was the case in 1938, this winter has had its cold spell, and on an even more imposing scale, but the results of this will not be seen until the 1940 accounts come along. On the present occasion there are the four abnormal months from September onwards to contend with—this abnormality including a total cessation of public lighting. Actually, the number of public lamps in commission during the time preceding the outbreak of war was 54,070, as compared with 53,632 in 1938, though over the whole year the total quantity of gas sold for public lighting was only 3,514,523 therms, as against a total of 5,665,129 therms in the preceding year. There was some increase in the quantity of gas sold in bulk, from 929,731 therms to 1,017,952 therms. The total quantity sold, as will be seen from the table, was 253,046,161 therms, as compared with 268,087,100 therms in 1938.

The capital account shows expenditure during the year of the sum of £223,637 on land, buildings, and machinery, and of £131,403 on mains and service pipes. The charges for new meters and appliances are more than off-set by the sums included for depreciation, and there appears an item of £343,770 for sale of land. As a result, the total figure for capital expenditure is somewhat reduced, and the balance on capital account is increased to £2,982,859.

The revenue account figures show a reduction in gross profit from £2,065,551 in 1938 to £1,724,932 on the present occasion. The gas sold per meter was at 9d., 9.75d., and, during the last few weeks of the year, 12.25d. per therm (with higher prices in certain outer areas), and, of course, there were special contracts, including "sundry processes." In 1938 the gas sold by meter was at 8.7d. and 9d. per therm. At the foot of the revenue account the customary statement appears to the effect that the total wages paid in the past year amounted to £3,543,098, and salaries to £1,228,127. For 1938 the figures were respectively £3,684,540 and £1,200,532. A new item in the revenue account this year is: "War expenditure—maintenance of supply, £251,234; active service allowances, £16,749. Less transferred to Special Purposes Fund, £153,322—£114,661."

From the balance sheet the temporary loan from bankers, which a year ago figured at £700,000, has been eliminated, and cash at bank and in the Company's hands is increased from £195,967 to the sum of £432,993. Stores on hand are somewhat less at £2,292,988, and hire-purchase and deferred payment accounts (less reserves) are down from £4,192,345 to £3,356,350. The amount invested in allied undertakings shows an increase from £666,129 to £750,393. A new entry is: "Civil Defence Suspense Account £420,758—expenditure of a capital nature and stocks, including recoverable amounts estimated at £85,000."

COMPARATIVE FIGURES FROM THE ACCOUNTS.

Revenue Account Expenditure.

	1939.	1938.
	£	£
Manufacture of gas	5,955,646	5,808,946
Distribution	3,913,131	4,267,059
Public lamps—lighting and repairing	100,432	138,832
Rents, rates, and taxes	763,194	616,992
Management	255,455	259,159
Co-partnership	116,774	130,602
Annuities and superannuation	281,891	274,050
Other miscellaneous charges, including war expenditure balance, make the total expenditure	£11,599,357	£11,600,938
Gross profit	£1,724,932	£2,065,551

Revenue Account Receipts.

	1939.	1938.
	£	£
Gas rental	8,878,680	8,808,386
Meter rental	447,967	447,572
Appliances rental	929,477	981,511
Fittings (prepayment supplies) rental	389,936	439,031
Residual products (less labour, &c.)—		
Coke	2,122,432	2,276,686
Breeze	125,581	149,406
Tar and tar products, including benzole	347,340	480,320
Ammoniacal liquor and sulphate of ammonia	17,142	7,642
Rents receivable	64,821	74,949
Transfer fees	913	986
	£13,324,289	£13,666,489

Coal and Gas Oil Used.

	1939.	1938.
Coal carbonized, tons	3,199,602	3,400,942
Gas oil used, galls.	7,111,551	7,227,113

Gas Made (and Purchased)—Therms.

	1939.	1938.
Coal gas, including purchased	243,880,620	259,213,041
Carburetted water gas	21,335,831	22,567,198
Total	265,216,451	281,780,239

Statement of Gas Sold, Used, and Not Accounted for.

	1939. Therms.	1938. Therms.
Gas sold—		
Consumer sales	231,908.830	246,099,800
Sundry processes	14,681,746	14,821,900
Correction for temperature and pressure	6,455,585	7,165,400
Total	253,046,161	268,087,100
Gas used on works, &c.	1,579,800	2,545,867
Quantity not accounted for	10,590,490	11,147,272

THIS "STARLIGHT"

A Convincing Demonstration of Wartime Street Lighting

Many a "Doubting Thomas" went home thoroughly converted as to the amenity value of wartime street lighting after a most interesting series of demonstrations in London last week. A "JOURNAL" representative attended these demonstrations and gives below some of his impressions.

THE subject of street lighting since the outbreak of war has been a particularly thorny one. The view has been held in many quarters that if we cannot go the "whole hog" and have peace-time lighting which can be extinguished on an air-raid warning, we may as well not waste money on this "synthetic starlight."

The powers-that-be, however, have remained adamant—and rightly so—that any form of lighting on peace-time standards is out of the question. The reasons are twofold and patently obvious. First, the sudden plunging into darkness of brilliantly illuminated streets would cause considerable confusion—if not even panic. The public would know that the black-out meant the possible imminence of an air-raid, yet would temporarily be blind and helpless in the blackness. Secondly, the speed of modern aircraft would very likely enable the enemy to "get a line" on their objective from many miles away before the authorities had time to extinguish the lighting which would show up as an enormous halo over the urban areas.

It remained, therefore, for those concerned to come to some agreement on a form of lighting which could remain in operation during an enemy attack and yet give away no vital information to those in the air. After much patient research and observation both on the ground and in the air, the British Standard Specification for Wartime Street Lighting (BS/ARP/37), which is by now familiar to our readers, was devised and approved by the Home Office.

Many Sceptics

Once the standards had been laid down, the Gas Industry went ahead with the design of appropriate fittings; and it may now be said that plans are sufficiently well in hand to meet orders without undue delay. But are the orders coming in? Unfortunately, there have been a large number of sceptics. Some of them can hardly be blamed, for they had no opportunity of judging for themselves the merits of this wartime street lighting. After all, 0.0002 ft. candle does not sound very much use to anybody. So the Joint Lighting Committee, on which the Ministry of Home Security (A.R.P. Department), the Illuminating Engineering Society, and the Association of Public Lighting Engineers are represented, arranged a series of demonstrations on Tuesday, Wednesday, and Thursday of last week, to which they invited the representatives of lighting authorities from all parts of the country.

The response was remarkable—which in itself is sufficient indication of the interest which is being taken in the subject. Between 150 and 200 delegates gathered each evening at the Empire Restaurant, Victoria, where the demonstrations were staged, and congratulations are due to the organizers for the admirable arrangements made. Mr. P. Good (Chairman of the Joint Lighting Committee) presided, and while our eyes were becoming accustomed to the darkness which was necessary for the demonstrations, he addressed to those present a few words of welcome and explanation of the purpose of the gathering. He explained that the method being followed is the result of long-continued experiments on street lighting, in which the laboratories of the leading gas and electric organizations had shared. From these experiments, aided by aerial observations, the conclusion had been reached that an illumination, as even as possible, of 0.00025 foot-candles was as much as could, for the time being, be safely provided without revealing too much to observation from above. These conclusions had been independently confirmed by some ingenious researches of Mr. J. M. Waldram, the results of which were demonstrated to those present. Mr. Good emphasized that this degree of lighting, of about the same order as starlight, could be maintained even during an air raid. Visitors would have an opportunity of inspecting the conditions in Westminster and of judging the "amenity value" even of this subdued lighting, which made all the difference, as compared with complete obscurity, in removing acute apprehension and in making movements in the streets relatively easy. During the period of an air raid, when other supplementary lights (such as head lights) would be extinguished, this permanent lighting would prove of great value.

Mr. C. W. Johnson (Under-Secretary of State at the Home Office), who followed Mr. Good, also briefly reviewed the problem, and paid a tribute to the value of the patient work conducted by the technical members of the Committee.

By this time we were pretty well acclimatized to the dark, and having been adjured by the Chairman to curb our desire to light our pipes and cigarettes during the experiments, we welcomed Mr. J. M. Waldram to the stage. Mr. Waldram has been largely responsible for the I.E.S. researches and has observed the results of tests from the air under varying conditions.

From an Enemy Plane

We were then invited to take a trip in an enemy bomber. But prior to this exhilarating experience we went into committee with our C.O. on the subject of our objective. On to the screen was thrown an aerial photograph—just the sort of thing we hope the enemy have not succeeded in taking over this country. It showed a more or less important urban area, including a big railway junction, under ordinary daylight conditions. To give us all a proper perspective the hall was divided into sections corresponding to height above the objective. The front rows represented about 2,000 ft.; the middle of the hall, 5,000 ft.; and the back, about 10,000 ft. We were asked to memorize so far as possible the principal landmarks, roads, &c.—so that we might recognize our objective when we took part in the aerial attack on the area.

Next was thrown on the screen the same scene, but this time as seen on a moonlight night. Moreover, as we were presumed to be approaching the area from a different direction, the photograph was a different way round from when we saw it originally. We tried to pick out our landmarks under varying degrees of moonlight and starlight. On a bright moonlight light we had very little difficulty in recognizing our objectives from all heights. The railway station stood out clearly defined; so did the main roads. On a night with no moon, on the other hand, even those at 2,000 ft. had difficulty in ascertaining their whereabouts, while those at greater heights could see little or nothing.

Then ordinary peacetime street lighting was switched up throughout the area. The effect was remarkable. The main roads stood out with startling clarity, even at 10,000 ft., and from their positions and directions we were able to judge the whereabouts of the railway junction with tolerable accuracy. This made the Home Office viewpoint abundantly clear. Even a point in complete darkness—like that railway station and junction—was revealed by its juxtaposition to an illuminated area nearby.

So now we turned to this "synthetic starlight." Wartime street lighting over the area was switched on and compared with various degrees of moonlight. When there was a moon the street lighting was to all intents and purposes entirely undetectable. On a dark night there was a faint iridescence running in indeterminate lines across the area. But it meant nothing to us in the air—even at 2,000 ft., which is a good deal lower than any enemy aircraft is likely to fly. If anything, it tended to confuse our preconceived ideas of the layout of the district. No more convincing proof was needed of the suitability of this street lighting from the aerial observation point of view.

All those who saw Mr. Waldram's most fascinating demonstrations will look forward to hearing from him at a later date how the ingenious screen projections were carried out.

Amenity Value

This, however, was only half the picture. We were satisfied that we were not giving anything away from the air. Now we wanted to know what value the lighting had from the point of view of the "man-in-the-street," for whom it has been devised. While our eyes were being brought back to normal lighting conditions, Mr. F. C. Smith, of the Gas Light and Coke Company, who is President of the Illuminating Engineering Society and Chairman of the Sub-Committee concerned, gave a brief outline of the basis of the Standard on which this wartime lighting was based. He explained how the specification (BS/ARP/37) both ensured that no appreciable light was emitted upwards and arranged that the light available was distributed over the roadway as evenly as possible and to the best possible advantage. Measurements in the streets at this low order of illumination were most difficult—except to those with expert photometric knowledge and adequate laboratory

equipment. The method adopted, of specifying the performance of the lighting unit, the height of suspension and the spacing, was the only practicable means of ensuring the desirable conditions being generally obtained. With the help of a photo-metric curve, he showed the light distribution from one of the new units, and indicated how different units were specified for different mounting heights in order to produce the same general level of 0.0002 ft. candle. We have already dealt fully with the Specification in the "JOURNAL" (Dec. 20 last). Mr. Smith finally demonstrated one of the illuminated signs specially devised for indicating the position of air-raid shelters. These are clearly visible at about 100 ft.

Before passing on to the second half of the evening's programme, it is only right to congratulate Mr. Waldram and his assistants upon the most convincing demonstration and the ingenuity with which the varying degrees of lighting were projected on to the screen.

A Tour of the Lighted Streets

Under the able direction of guides, we next toured the lighted streets in the vicinity. The route, arranged jointly by Mr. C. I. Winstone (Gas Light and Coke Company) and Mr. M. E. Pyser (Central London Electricity, Ltd.), was well planned, for on emerging from the Empire Restaurant we found ourselves in unlighted streets, along which we had to walk for several hundred yards before reaching the lighted area. The contrast was most striking. Immediately we entered the lighted area we ceased to apologize for bumping into each other and treading on each other's heels. Hand torches which had been much in evidence before were dispensed with. The kerb was clearly visible. Pedestrians could be discerned at distances of 50 ft. and more away. There was altogether a feeling of greater confidence.

The first section traversed was lighted by electricity and the second by gas. Lamps of varying mounting heights from 10 ft. to 23 ft. were in operation, and at one point arrangements were made for switching off the lighting so that we could judge the difference. This tour was all the more valuable for embracing different types of streets—main roads, with plenty of traffic, side roads, roads with tall buildings on either side, and roads adjoining the large open space of Vincent Square. Everywhere the lighting effect was uniformly good.

One point is worth comment—namely, the effect of the "starlight" illumination in roads carrying a fair volume of traffic. We think that possibly those who have most belittled this war-time street lighting have only seen it under traffic conditions. In these circumstances it stands to reason that the pedestrian, continually dazzled by the lights of motor vehicles, fails to appreciate that the street lighting has any appreciable effect at all. To some extent he is justified in this opinion. On the other hand, the traffic lighting itself illuminates the road, and, though inclined to dazzle, does give the pedestrian an idea of where he is. To the motorist the lighting provides a framework which is of considerable help in driving. We heard the view expressed that it was unfortunate that the light source could not be seen from a greater distance away, because if it were it would give a better idea of the general direction of the road. So far as this traffic question is concerned, however, it is obvious that even the most important roads do not carry lighted vehicles all the time; and after all, it is during those periodical "black-outs" when there is no traffic about that the true value of the "starlight" illumination is brought home to the pedestrian.

Useful Discussion

At the conclusion of the tour we returned to the Empire Restaurant for a general discussion. There, too, was arranged a display of the Standard lighting fittings, both gas and electrical. In reply to a question as to whether the gas lighting unit had reached a reasonable state of finality, Mr. F. C. Smith pointed out that the manufacturers had got together and had standardized the fitting. He would not say that improvements might not be effected; but any improvements would not mean scrapping the units already existing but rather the modification of that unit. Mr. E. J. Stewart (President of the Association of Public Lighting Engineers) also addressed the gathering.

The main impression left by this series of demonstrations was one of agreeable surprise. For many of those who attended it was the first introduction to wartime street lighting, and on every side we heard expressions of approval. There is no doubt whatever that the illumination has a definite amenity value far in excess of what many expected; and the demonstrations must have done an enormous amount of good in convincing those who still hesitate to embark on this form of lighting in their own areas. While there was a general recognition that this amount of permanent lighting had a definite value, especially if the present conditions continued for some time to come, the question of cost was regarded as a difficult one. In this connexion it was explained that the Government were not prepared to make any specific grant for the purpose. On the other hand, it is possible that the Ministry of Health might be approached to sanction short term loans for wartime street lighting, and this matter is now under consideration.

At the conclusion of the meetings the Chairman paid a tribute to the work of the various technical committees.

The Gas Industry's Part

This brings us from the general to the particular. In short, to gas and the part it can play in the scheme. As is well known, certain leading firms of manufacturers under the auspices of the Society of British Gas Industries agreed to collaborate in the production of the Standard unit and sell it at a standard price. Just another instance of the solidarity of the Gas Industry. But there was a good deal more in it than that. Plans and specifications had to be prepared. Tools had to be specially cut at a cost of many hundreds of pounds for the production of the pressed steel and brass parts. The firms went out of their way to place themselves in a position to meet substantial orders. In other words, they were sufficiently patriotic to gamble on a totally unknown demand—a demand which might or might not result in a not inconsiderable loss to themselves.

Up till now it must be admitted that the demand has been disappointing. Many local authorities hesitated to commit themselves to what, after all, was a gamble from their point of view too. For who could say how long the war would last? Might not all the fittings purchased be on the scrap heap in six months' time? That was one of the reasons, perhaps, why these demonstrations were organized in London; and they will without a doubt have the effect of turning the scales in many instances. They will bring home to many local authorities that this form of lighting is something they owe to their ratepayers.

But—and it is a very important "but"—it is incumbent upon local authorities to make up their minds at once. As has been indicated, the manufacturers have spent a great deal of money to put themselves in a position to meet the demand. It is only fair to them to place orders for equipment as soon as possible. How else can they order their supplies of the necessary raw materials which may be subject to several months delay in delivery? If the decision is shelved till after the summer—and the war goes on—there may be serious delays in executing orders.

Gas undertakings, therefore, should do all in their power to expedite a decision on the part of their local lighting authority. It is not a matter of gas versus electricity. It is merely a question of converting the existing lighting fittings to conform to the A.R.P. Specification.

Extension of the Specification for Wartime Street Lighting

Although the installation of the new form of street lighting is in many parts of the country only just beginning, a revised edition of the British Standard Specification BS/ARP/37 has been issued. This revision, however, does not modify the provisions of the original edition (dated December, 1939) but extends them in a very useful direction. There are two main additions, these being:

(a) The inclusion of standard curves of light distribution for fittings intended for mounting heights between 9 ft. and 14 ft. (nominal mounting height 10 ft.), and for use where the spacing is less than 100 ft. but is not less than 50 ft. These fittings are designated "10 ft. SS" to distinguish them from the 10 ft. nominal mounting light fittings intended for spacings over 100 ft.

(b) An appendix has been added, giving notes on the design and testing of fittings purporting to comply with the specification. These notes are given primarily for the guidance of those concerned with the designing and production of fittings for which certification is desired, but they will doubtless prove of interest to a much wider circle of readers of the specification as the notes deal generally with photometric measurements at very low candle-powers.

Standard Gauges for A.R.P. Lighting (BS/A.R.P./30)

One of the difficulties in complying with the provisions of the various regulations and specifications in connexion with A.R.P. Lighting is that the illumination values are expressed in foot-candles. The measurement of illumination in terms of foot-candles presents no difficulties in properly equipped laboratories, but it is quite a problem to evaluate illumination "on site," particularly when the level of illumination is of the low order imposed by A.R.P. restrictions.

With this in view, gauges for checking low values of illumination have been developed, and a British Standards Specification (BS/ARP/30) has been published. The nominal values of illumination for which gauges are prescribed in the specification are 0.0002, 0.002, 0.02, and 0.2 foot-candle, and means may be provided for enabling more than one of these values to be gauged with the same instrument. The specification aims at ensuring the necessary accuracy combined with portability, but leaves the manufacturer free to develop his own design.

Copies of these specifications can be had from the British Standards Institution, 28, Victoria Street, London, S.W.1, prices respectively 6d. and 3d.

Use of Producer Gas for Motor Transport

Results of over 400 road tests, covering approximately 50,000 miles, using nine vehicles, 22 producers of nine different types, and over 120 distinct fuels, including 40 types of anthracite or fuels derived from anthracite, are reviewed in the report of the Committee on the Emergency Conversion of Motor Vehicles to Producer Gas just issued after nearly three years' work under the chairmanship of Sir Harold Hartley. The report declares that high-temperature coke normally made in gas-works and coke ovens is not suitable for existing types of producer.

THE Committee was set up in May, 1937, at the special request of Viscount Caldecote, then Sir Thomas Inskip, Minister for Co-ordination of Defence, to investigate producer gas as an alternative fuel to petrol for commercial and passenger service vehicles, with particular reference to the consideration of the means by which (in the event of an emergency) such vehicles could quickly and cheaply be adapted to use this gas. Since its inception the Committee has carried out extensive experimental work, including bench tests and road tests, both under normal operation and under scientifically controlled conditions.

The Committee began by carrying out road trials on various types of service with commercial producers, which showed that, subject to certain unavoidable limitations, producer gas is a satisfactory fuel for road transport. Nevertheless, certain difficulties were encountered, and these, together with the special considerations attending the use of producer gas in an emergency, the problem on which the Committee had to report, led it to undertake the design of a simple producer suitable for the conversion of existing vehicles and capable of rapid mass production at a minimum cost, using only metals, plant, and the type of labour likely to be available in war time.

The design of the producer equipment, including coolers and filters, passed through a number of stages, at each of which it was submitted to road tests, and in its present form it has given such satisfactory results in different types of service that the Committee recommends that the design be considered for manufacture.

Vehicles up to Six Tons

The equipment was designed for vehicles up to six tons laden weight, with engines up to four litres capacity; for larger vehicles slight modifications may be necessary to the coolers and filters, but no new major problems should arise. To assist rapid conversion at the minimum cost in time, labour and expense, the Committee has also designed a trailer unit carrying the producer and its auxiliary gear—*i.e.*, coolers and filters.

The Committee has carried out extensive work on filtration methods, and tests are still proceeding. Finality on this subject has not yet been reached, but existing methods are sufficiently satisfactory for immediate application.

The practical experience of the Committee compels it to stress the need for good workmanship and correct dimensions in the manufacture of producer gas plant. This can only be safeguarded by competent inspection during manufacture. The Committee also suggests that before departing from any dimensions shown in the drawings of the emergency producer, manufacturers would be well advised to take advantage of the information available at the Fuel Research Station.

Concurrently with the work described, the Fuel Research Station has, as part of its normal programme, examined the fuel position and has carried out extensive experiments on alternative fuels. The work is still proceeding and includes the preparation of producer fuels by methods not previously used. The annual supply of fuel suitable for producer vehicles which is likely to be available is estimated to be sufficient for several thousand vehicles at once and approaching 10,000 in the fairly near future; this would be enough for initial requirements on a reasonably large scale. There is good reason to hope that this quantity will be increased should experiments now in hand fulfil their present promise. In any period of vital emergency the fuel supply could be increased by the diversion of anthracite and low-temperature coke from their present uses.

The Committee's Conclusions

Provided suitable equipment and fuels are used producer gas can be regarded as a practicable alternative fuel for motor vehicles, and can be recommended for use in an emergency for certain types of road transport. The producer plant designed by the Committee may be regarded as satisfactory in operation with low volatile anthracite and certain low-temperature cokes. The Committee's design of producer plant is simple, but its satisfactory performance is dependent on strict adherence to the leading dimensions given and good workmanship in manufacture.

The use of the producer on a trailer would generally obviate the complications and costs arising from mounting the producer direct on the vehicle, but the method to be preferred is dependent upon individual circumstances. The use of an effective gas filtration system is essential. The Committee have obtained good results using sisal tow, and also oiled coke followed by sisal tow, as filtering media.

It is somewhat difficult to estimate accurately the overall costs of operation with producer gas, as these are affected by such diverse factors as loss of power, possible loss of loading space and extra costs of servicing. Actual fuel costs under present conditions should be appreciably less than with petrol. The extent to which this will offset or exceed the increased costs will depend on conditions and price levels.

There is a possibility of increased cylinder wear to an extent which may be appreciable but is not likely to be prohibitive given proper servicing of the filters and coolers. Modifications to engines are not essential, although in certain circumstances they will improve performance. The fitting of complicated controls is not regarded as necessary, and the training of a suitable number of drivers will not present serious difficulty.

With most designs of producer plant the use of a certain amount of petrol is necessary. This avoids the cost and complication of a fan and facilitates manœuvring. The danger arising from the asphyxiating properties of producer gas, and the fire risk involved, are not serious provided reasonable precautions are taken. Gas producer vehicles can be used for local delivery work, although they are much more suitable and economical on long distance work.

Availability of Fuel

It is of the utmost importance that producers should not be used with unsuitable fuels. The position regarding availability of fuel is that: (a) Sufficient anthracite for several thousand vehicles can be made available at short notice; but the quantities of specially dried fuel, which is not however required for the emergency producer, are very limited; (b) the addition to (a) of the low-temperature coke which it should be possible to make available, without undue disturbance of existing markets and if certain plant were installed at low-temperature works, should provide sufficient fuel for approaching 10,000 vehicles; (c) in any period of vital emergency larger quantities of fuel could probably be diverted for use with producers should the national interest demand this; (d) there is reason to hope that the potential fuel supply will be largely increased, by the addition of certain types of coke, should experiments fulfil their present promise.

The report emphasizes that potential manufacturers and users of producers should bear the fuel position in mind when considering their plans.

The general experience of operators of producer-gas vehicles, including those represented on the Committee, is that it is of the utmost importance that producers should not be used with unsuitable fuels. The principal fuel used abroad and that for which the majority of successful transport producers have been designed is charcoal. Excellent results can be obtained with this fuel, but as it is not available in large quantities in this country, it is necessary to seek alternatives.

A suitable fuel should be "highly reactive" in order to give flexibility in operation, and it should be free from tarry constituents, as these are liable to be distilled from the fuel bed and to be deposited in the engine, which can be easily put out of action by a comparatively small quantity of tarry matter. The fuel should be relatively free from ash, which, if excessive, will form large masses of clinker in the producer, thus interfering with its operation, and may also lead to an excessive increase in the resistance of the filter or may lead to increased engine wear. The size grading of the fuel is important, and affects both the quality of the gas made and the general performance of the producer. When certain types of filter are used, the moisture content of the fuel must be kept very low, but the types recommended for use with the emergency producer are not susceptible to troubles arising from this source.

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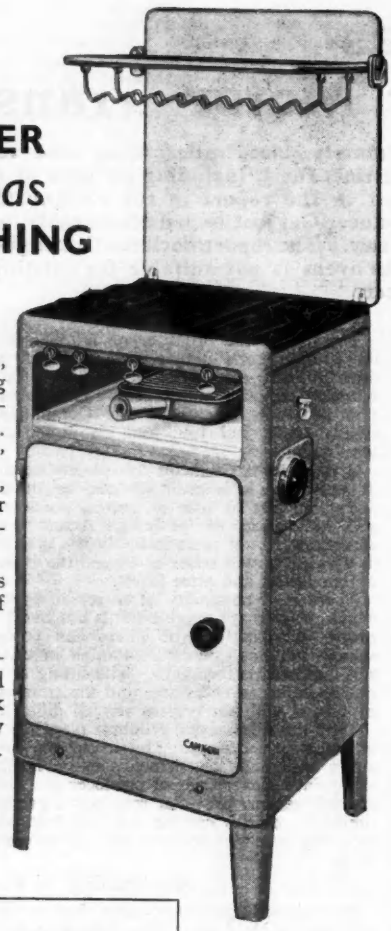

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Certain types of anthracite and of low-temperature coke have been found to be suitable fuels immediately available in relatively large quantities in this country.

In a special investigation by the National Coal Survey of the Fuel Research Station, representative samples of anthracite were collected from over the whole of the South Wales field and examined both in the laboratory and by means of a comprehensive scheme of road tests, at the Fuel Research Station. A similar investigation is proceeding in connexion with the Scottish coal fields.

In the course of this work it has been possible to determine the limiting safe values of the various characteristics and to draw up a specification for suitable fuel, including such items as the maximum permissible tar content and ash content. From this information it has been possible, in collaboration with the Mining Industry, to state from what mines suitable fuel can be obtained and to estimate the maximum potential output of producer fuel.

With regard to size, tests with various grades of fuel have shown that the optimum grading is about $\frac{5}{8}$-$\frac{1}{4}$ in., but that satisfactory, though somewhat inferior, results can be obtained with a range of $\frac{3}{4}$-$\frac{1}{4}$ in. or even $\frac{1}{2}$-$\frac{1}{8}$ in.

A similar investigation in connexion with "artificial fuels" indicates that almost any process for the low-temperature carbonization of coal can be made to produce fuels suitable for transport producers, provided that the raw coal from which the fuel is made is suitably selected and the process is modified so as not to permit more than a limited amount of "potential tar" to remain in the finished product. It must be stressed that a low-temperature coke which is perfectly suitable for domestic use is not necessarily suitable for use in transport producers.

A provisional specification of the characteristics of fuels suitable for the emergency producer (together with a memorandum explaining the method evolved at the Fuel Research Station for the determination of "potential tar") is included as an appendix to the Report.

Fuel Supply

Throughout the investigation the Committee had principally in mind the possibilities of producer gas for replacing petrol during a war in which enemy action caused serious interruption to petrol supplies. After investigating the question it understands that the quantity of suitable anthracite potentially available in such circumstances is large, although its widespread use for producers would inevitably involve extensive diversion from existing markets. In an emergency of this kind such diversion could, it is suggested, reasonably be contemplated.

The amounts of suitable anthracite available in present circumstances are considerably smaller, but the Committee is informed that quantities sufficient for several thousand vehicles can be made available at short notice. The coal producers have explained, however, that for technical reasons it will not be possible to supply specially dried fuel in any quantity. It was with this difficulty in mind, and that of maintaining dried fuel in that condition, that the Committee laid down as one of the essentials of design that the equipment should be capable of use with wet fuel.

The Committee understands that, in addition to anthracite, relatively large quantities of low-temperature coke could probably be made available in the event of a demand, though the construction of certain additions to existing plant would be necessary. The quantities of these two fuels which are in view under relatively normal commercial conditions should, it is thought, be sufficient to supply approaching 10,000 vehicles.

There are two methods by which the amount of available fuel might be permanently increased—namely, (*a*) by the design and development of new types of producer capable of dealing with a wider range of fuels than could be used in existing types, and (*b*) by the treatment—*e.g.*, by carbonization—of fuels at present unsuitable, to render them suitable for use in existing designs of producer. Both methods are being actively investigated, and experiments at the Fuel Research Station give reason to hope that a suitable producer fuel can be prepared in large quantities by carbonizing selected coals under special conditions in ordinary gas-works retorts. "High-temperature" coke normally made in gas-works and coke ovens is not suitable for existing types of producer.

Co-ordination of Development

Consideration of the present fuel position makes evident the need for co-ordination between the rate of development of transport producer manufacture and the rate at which suitable fuel can be made available throughout the country.

On the fuel side the problem of distribution requires careful consideration, having regard to both quantity and quality. It is essential not only that users should get sufficient fuel, but also that they should obtain fuel complying strictly with an approved specification. This point is at least as important with solid fuels as with liquid fuels.

It is understood that the fuel industry is actively engaged upon this side of the problem, and it is hoped that prospective users and firms proposing to manufacture producer gas equipment will bear the fuel position in mind when drawing up their plans.

PROVISIONAL SPECIFICATION OF FUELS FOR THE EMERGENCY PRODUCER

	Anthracite.	L.T. Coke.
Volatile matter	Less than 7% ...	Variable.*
"Potential tar"	" " 15 oz. per ton.	Less than 10 oz. per ton.‡
Hydrogen (dry ash free basis)	" " 3.7% ...	——
Ash	" " 4% ...	Less than 5%.
Moisture	Not limited§	Not limited.§
Size	¼in.-⅝ in. ...	¾ in.-⅛ in.

Volatile matter and ash determined by the methods given in B.S.S. No. 735, hydrogen by the method given in B.S.S. No. 687, and "potential tar" by the method described in the report.

* Should be as high as possible, provided that the limit for "potential tar" is not exceeded.

‡ Provisional figure.

§ Except for fabric filters.

Experiments on Warming a Room by Gas

Notes by N. S. BILLINGTON, M.Sc., from the "Journal of the Institution of Heating and Ventilating Engineers"

WITH a view to obtaining some knowledge as to how the ventilation of a warmed room is affected by the method of heating employed, a study was made during the winter of 1937-8 of the warming and ventilation of one room in a house. The study did not purport to be in any way comprehensive, and it was pointed out that all the experiments were carried out in an unfurnished room. Further tests have now been made to determine the effect of furniture upon the warming of the room.

The room in which the experiments were made is the north room on the ground floor of the experimental house. It measures 14 ft. by 13 ft., is 9 ft. high, and has external walls 9 in. thick of Fletton bricks in lime mortar, except on the east where the wall is well insulated with a cavity and hollow diatomaceous building blocks. The walls are plastered and distempered and the windows are of a normal casement type. The ground floor is of concrete covered with oxychloride flooring and the ceiling is of lath and plaster with an ordinary timber floor above it.

A modern gas fire, which is representative of appliances emitting a considerable proportion of radiation, was chosen as the method of heating and the furniture comprised a book cupboard with shelves above it, two armchairs and a couch. The floor was covered with an Axminster carpet with an underfelt and the bookcase was placed opposite the fire, against an external wall which faces north.

The fire which is fitted with a two-way tap, allowing either four or seven burners to be used, was lighted at 8.30 a.m., and after three hours the tap was turned so that only four burners were alight. (The gas consumption was not reduced in proportion to the number of burners.) In this way the room was rapidly warmed and maintained at a comfortable temperature. The gas consumption for the day amounted to 1.4 therms, the fire being extinguished at 5.30 p.m.

The test occupied a period of three weeks. The furniture was in the room for the second week and during the first and third weeks the room was unfurnished. It was, of course, not possible to control the weather during the tests, and in order to put the experiments on a common basis the recorded temperatures were adjusted to allow for the variation of mean shade temperature, a daily mean temperature of 40° F. being taken for this purpose.

The air temperature and the equivalent temperature were recorded on a eupatheoscope placed directly in front of the fire and 8 ft. away from it. It was observed that after turning the fire down, there was a slight fall in the equivalent temperature, amounting to about 2° F., and that the low fire was sufficient to maintain the room at this level for the rest of the day. It is apparent from the records that when furnished the room is not only more rapidly warmed, but is altogether warmer and does not become so cold in the night. During the day the equivalent temperature in the furnished room was on the average 5° F. higher than in the unfurnished room, and the general effect of the furniture was to increase by 25% the heating effect of the fire.

The investigation shows that, by intercepting radiation from the fire, furniture has a definite effect upon the warmth obtaining in a room, the general effect in the particular case which was studied being equivalent to a 25% increase in the heating effect of the gas fire.

Wartime Street Lighting by Gas

Institution Communication No. 225

Memorandum prepared for and approved by the Joint Lighting Committee of The Institution of Gas Engineers

I VALUE OF THE NEW STREET LIGHTING

The permanent illumination now permitted in our streets throughout the greater part of the country as defined in the new British Standard Specification BS/ARP 37 (January, 1940), is 0·0002 foot candle.

It is important at the outset to form a clear idea as to the amount of this illumination, and its advantages and limitations.

A common standard of lighting provided in pre-war days was what was termed "Class D" lighting. This required a minimum illumination at road level of 0·2 foot candle. The war-time illumination now permitted (0·0002 foot candle) is therefore one-thousandth of the minimum illumination required for "Class D" pre-war lighting, or about twice the equivalent of bright starlight on a clear moonless night.

Every pedestrian and motorist would undoubtedly like more than this amount of light; but it must be clearly recognized that, after many months of experiment and observation from the air, the general standard of lighting finally approved by the Minister of Home Security is the utmost that can be permitted in the wider interests of National Defence.

Although the standard of war-time street lighting permitted as being safe for use even when enemy aircraft are overhead is so comparatively small, it has a definite amenity or comfort value to pedestrians, and is a distinct aid to movement. Its value cannot be fairly judged on a bright moonlight night or in a busy thoroughfare rendered temporarily bright by many headlights, since these conditions obtain during only part of the time when pedestrians, drivers of vehicles, and police and other officials have to make use of the streets. Indeed, this war-time lighting is designed as much for side streets and residential areas as for main roads and city thoroughfares. Streets in which it has been installed have been visited by representative bodies of Government, municipal and police authorities, and it is agreed that, as an aid to the pedestrian in finding his way about, the amount of light provided is sufficient to enable him, if he knows a district and some of its landmarks or characteristics, to ascertain his exact position without the aid of a torch. To anyone walking in a district unknown to him it will also be of assistance, and it will save him from that sense of bewilderment which is not infrequently experienced by pedestrians when they find themselves in almost complete darkness.

In time of an air raid warning, when car headlamps would be extinguished, it should help materially to preclude panic, to aid the rapid clearing of streets, and generally to assist A.R.P. personnel.

At the same time it is recognized that, even when the new low-power lighting is in use, it will still be necessary to use all the other aids to movement now permitted under the regulations, and for both motorists and pedestrians to continue to exercise the greatest care to prevent street accidents. The street lamps will give a driver an indication of the route ahead and of his position relative to the kerbs, and he will be enabled to devote more attention to traffic in his vicinity.

II STATUTORY OBLIGATIONS

As already indicated, it is the intention that this new street lighting shall remain permanently in operation even throughout air raids, a concession which cannot fail to be of advantage to the public, to A.R.P. personnel, to the police, and to other public services.

This important concession, however, carries with it definite obligations on the part of those who supply the lighting fittings and of the lighting authorities who use them, to ensure, primarily, that the permitted standard of illumination shall at no time be exceeded. This obligation is, in turn, coupled with a number of other essential safeguards of a technical or practical nature (see Appendix).

Fixed Distributions and Intensities of Light

Since only a strictly limited amount of light may be provided, the British Standard Specification BS/ARP 37 requires that lighting fittings shall have light distributions and intensities to conform with certain values. These distributions and intensities, which are the only ones permitted, have been planned, as the result of prolonged and careful investigation, to ensure that the maximum amenity value may be experienced by the public from the limited amount of light permissible.

Since it is intended that for the low-power lighting the existing columns shall be used the mounting heights at present in use have been grouped into three broad classes. For each class the limitations upon the distribution and intensities are clearly indicated in the Specification by means of diagrams. A study of these diagrams and also of Clause 3 of the Specification will make it clear that the distributions must in each case fall within two limiting curves.

In the case of the fitting for the "nominal 10-ft. mounting height", for example, it will be seen that the candle-power curve of the fitting must come within the shaded portions, both maximum and minimum. Only fittings conforming with these requirements will be permitted.*

No Variation of Fittings After Installation

Reference to Clauses 6 and 8 will show that fittings which have the agreed light distribution must also be constructed in such a manner that those parts which control the optical properties cannot be varied during use, as the result of maintenance or wear and tear.

III STANDARDIZED FITTINGS FOR GAS UNDERTAKINGS

So far as the Gas Industry is concerned, it should be noted that members of the Lighting Section of the Society of British Gas Industries are standardizing fittings which will bear the

FIGURE 1.—*Typical Certification Marks of the British Standards Institution.*

essential registered "Certification Mark" of the British Standards Institution (Figure 1). This relieves Gas Undertakings and lighting authorities of anxiety, since fittings bear-

* A certain amount of asymmetry is permitted under Clause 3.

ing the B.S.I. mark are satisfactory for a given mounting height and spacing.

The Specification does not require that only fittings (whether gas or electric) designed specially for the purpose must be used. Local Authorities can, if they have the requisite facilities, adapt existing lamps to conform with the Specification. Samples of such adapted lamps must, however, be submitted for test to an "approved testing authority" and the test must be carried out at the expense of the applicant. The results of the test, together with certain other information, must then be sent to the Mark Committee of the

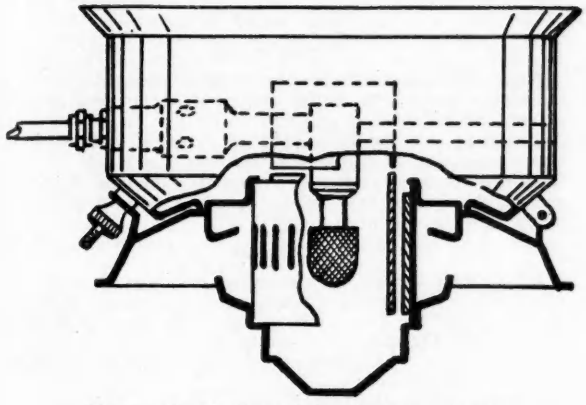

FIGURE 2.—*Section of Standardized Fitting.*

FIGURE 3.—*Globe-type Lantern.*

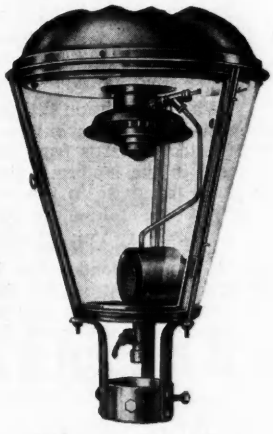

FIGURE 4.—*Circular Panel Lantern.*

British Standards Institution, and an assurance must be given that, when adaptations on similar lines are made in bulk, those adaptations will conform strictly with the sample submitted. Drawings of adapted existing lamps must also be submitted before approval is given. The British Standards Institution, moreover, reserves the right to check from time to time such fittings which have received its certification mark, in order to make certain that modifications have not subsequently been introduced. Full details of the scheme for the granting of licences to use the registered certification mark of the British Standards Institution can be obtained on application to the British Standards Institution, 28 Victoria Street, London, S.W. 1.

With few exceptions (and especially in places where facilities for rigid control do not exist) the obligations which would be imposed on authorities adapting their existing lamps instead of using the standardized fittings would prove onerous, both technically and financially. In general, it has been found that adaptations are expensive. Very little, if any, saving can be effected, particularly if the cost of research work and testing is taken into account. Adaptations, therefore, would seldom be financially justifiable, since every effort is being made by the gas lamp manufacturers to produce standardized fittings in mass, and therefore at the lowest possible price.

Figure 2 shows a section of a standardized fitting, while Figures 3 to 6 illustrate a number of typical conversion fittings for different types of lamp which have already received the registered certification mark of the British Standards Institution.

The same fittings (perhaps with minor alterations, which matter will be looked after by the gas lamp manufacturers) can be fitted to most of the well-known makes of lantern of the general characteristics shown in Figures 3 to 6.* When ordering the fittings, the mounting height size of fitting (in accordance with the Specification), the pressure on the district or at the outlet of the governor, and the actual make and size of lantern to which it is to be fitted should be clearly indicated. In almost every case the installation of the conversion fitting in or on the lamp should be a simple matter. The lamp manufacturers will issue precise instructions which can be followed by an intelligent fitter.

Lanterns of panel type as shown in Figures 4 and 5 should be blackened from the top down to a level equivalent to the

FIGURE 5.—*Square Panel Lantern.*

FIGURE 6.—*Box-type Lantern.*

bottom of the shade of the conversion fitting. Care must be taken to render the opal glass tops of lanterns opaque, so that no appreciable amount of light can escape, either through the top or by means of the flue outlet. It is usually advisable to remove the existing burner from panel lanterns, to provide for efficient ventilation.

---

* Typical conversion fittings may be obtained from:
William Edgar and Son, Limited.
Falk, Stadelmann and Company, Limited.
Foster and Pullen, Limited.
C. H. Kempton and Company, Limited.
William Parkinson and Company.
William Sugg and Company, Limited.

IV INSTALLATION OF WAR-TIME STREET LIGHTING

Spacing

It will be noted from Clause 4 of the Specification that the lamp spacings, which are one of the controlling factors in the choice of fittings, are the distances between adjacent fittings "measured along a line joining them in plan". In other words, the controlling spacing is the distance in a straight line between one source of light and the next.

Standard Installations

The fittings specified are designed primarily to give the correct amount of illumination when the lamps are spaced 100 ft. apart. No difficulty should arise in choosing, from the information given in the Specification, the correct fittings for lamps of any given mounting height, provided the space between the lamps is not less than 75 ft. in the case of normal mounting heights of 15 to 20 ft. For cases of nominal 10-ft. mounting height a special distribution is given for spacings of 50 to 100 ft.

Spacing not less than 100 ft.

If a lighting authority is dealing with a 25-ft. mounting height, exactly the same fitting will be used as that designed for a 20-ft. mounting height. If the mounting height is between 14 and 19 ft. the fitting designed for a 15-ft. mounting height will be used. Similarly, if the mounting height is between 9 and 14 ft., the fitting designed for a 10-ft. mounting height will be used.

Prior to ordering fittings the lighting authority must ascertain:

(i) the existing mounting heights;
(ii) the distances between posts.

In all cases, if the distances between posts are 100 ft. or more, the policy already indicated can be adopted when ordering fittings.

Spacing between 75 and 100 ft.

It may be found that in a few cases lamp spacings are less than 100 ft., as indicated, for example, in Figure 7.

In such cases one of the three following courses can be adopted:

(i) Cut out lamps 2 and 4 and provide fittings only on lamps 1, 3 and 5. In this case the fittings required will be those for lamps of mounting heights as given in the first table of Clause 4. The lighting, however, would be provided from one side of the street only —hardly a desirable feature.

(ii) Equip posts 1 and 4 with the new lighting fittings, leaving posts 2, 3 and 5 unlighted. The fittings required will be those for lamps of mounting heights as given in the first table of Clause 4. In this case the lighting would be "staggered," but the distance between adjoining lighted lamps would be considerable, and in consequence the resulting illumination on the street would be very low.

(iii) The Specification provides a third alternative, which is probably the best. Assuming that the mounting height of the columns in the street illustrated diagrammatically in Figure 7 is between 14 and 19 ft., then a fitting designed for a 10-ft. mounting height could be provided on every lamp, in accordance with the second table of Clause 4. If the mounting height of the lamps were 19 ft. and upwards, then every lamp could be provided with a fitting designed for a 15-ft. mounting height.

If the mounting height is less than 14 ft. a fitting to conform with the special distribution curve mentioned at the end of Clause 4 should be used.

The provisions in Clause 4 will thus enable the lighting authority to deal on simple lines with the great majority of existing installations.

Lamps Very Closely Spaced

In certain isolated cases, however, the distances between columns may be less than 75 ft. In general this will be associated with low mounting heights and to cope with such cases a distribution curve for a fourth unit of nominal 10 ft. mounting height is included in Figure 4 of the Specification.

Lamps Widely Spaced

Where the spacing of lamps exceeds 100 ft. it is still the intention to fit on each column the unit specified in Clause 4. Greater spacing will have the effect of reducing the illumination between the lamps, but generally not to an extent appreciable to the eye.

Mounting and Erection

Vertical Fixing

An essential requirement of the Specification is that contained in Clause 5, to ensure that no light whatever shall go above the horizontal.

Obviously this stipulation will not be satisfied (even if the approved fitting is correct) if the fitting is tilted. It must therefore be fixed vertically and with sufficient rigidity to prevent the light at any time going above the horizontal, e.g., by swinging in the wind.

Side Screens

Where there are very light-coloured vertical surfaces in close proximity to the lighting fittings, screens should be provided. In this matter the Gas Undertaking or the lighting authority should seek the gas lamp manufacturers' advice regarding suitable screens, which have already been designed and should be quite inexpensive.

It must not be thought, however, that no light whatever is to be allowed to fall on adjoining houses or shop fronts. As long as this light is not excessive, a great deal of the amenity value of this low-power street lighting comes from light reflected from buildings. Experience shows that only in exceptional cases will screens be necessary.

Prevention of Upward Reflection of Light

When conversion fittings are put into existing lanterns, care must be taken to ensure that no light from the fitting is reflected upwards from the glass panels or any other equipment in the lantern. The gas lamp manufacturers are prepared to advise in this matter and, if necessary, to provide any simple additional screen which may be necessary.

V TESTING AN INSTALLATION

It is not intended that illumination measurements shall be made on the street, for three reasons:

(i) It would be very difficult to measure such low intensities with any degree of accuracy. This will be appreciated from the fact that starlight gives intensities comparable with that provided by the installation, and that it is not possible to screen off such extraneous light.

(ii) The measurements of illuminations of the order permitted, apart from the difficulties mentioned in (i) above, would involve the use of expensive and delicate photometers by highly skilled persons. The need for careful dark adaptation and the relative insensitivity of the eye at these low levels make any measurements subject to considerable photometric error.

(iii) Tests on the street are unnecessary, since fittings bearing the British Standards Institution's registered certification mark are designed to give the correct light output and distribution. If, therefore, those fittings are used in accordance with the requirements of the Specification as to mounting heights and spacings, the illuminations permitted cannot be exceeded. (The exceptional case in which screens are needed will be obvious without actual test measurements.)

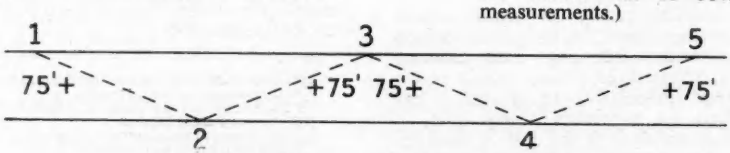

FIGURE 7.—*Lamp Spacings less than 100 ft.*

The cases in which extreme care in the choice and arrangement of fittings will be necessary will arise in streets where the spacings of the lamps are short, i.e., below 100 ft.

APPENDIX

Letter from Ministry of Home Security to Local Authorities in England, Wales and Scotland

23rd December, 1939

Sir,

A.R.P. Department Circular No. 344/1939
Street Lighting

I am directed by the Minister of Home Security to say for the information of your Council that he has had under consideration the question of the restoration of some form of street lighting which would satisfy the conditions imposed by strategical requirements and at the same time be of value in facilitating movement in the streets. It would be unsafe to restore lighting of anything approaching the peace-time intensity, owing to its visibility from the air at considerable distances. Nor would it be possible to contemplate the use of devices to switch off street lighting on receipt of an air-raid warning, since any such arrangement would have the effect of plunging the streets into darkness just when light is needed for persons in the streets to find shelter, thus leading to serious confusion, or even panic.

It has accordingly been decided that if street lighting is to be restored, it must be of such a low intensity that it can be safely left on during any period of air raid warning. Experiments which have been made show that this condition is fulfilled by lighting of an intensity not exceeding on the average 0·00025 foot candle on the ground.

As will be seen from the Minister's statement in the House of Commons on 14th December, 1939, he is prepared to permit the use of street lighting of this intensity in all districts except those on or near the East and South-East Coasts. For the present, street lighting will not be permitted in any Borough, Urban District or Parish in England, nor in any Burgh or Special Lighting District in Scotland, any part of which is within twelve miles of the East Coast, or of that portion of the South Coast which is East of and includes, Southampton, or in the Isle of Wight. The question of any modification of this limit is at present under consideration, and a further communication defining the area more precisely will be sent in due course.

This concession can only be permitted if the lighting does not exceed the average intensity already referred to, since even a slight excess of intensity may produce visibility from the air at dangerous distances. As indicated, therefore, in the Minister's statement, this will be secured by a requirement in the Lighting (Restrictions) Order that only fittings complying with the specification and stamped with the B.S.I. mark, specification number, nominal mounting height and size of the lamp or mantle, may be installed. Copies of this specification may be obtained from the British Standards Institution, 28 Victoria Street, London, S.W. 1, price 8d. post free. Local Authorities, if not already aware of the procedure for securing the mark on any fittings they may decide to manufacture, may obtain full particulars from the Institution. For those desiring to purchase marked fittings, arrangements have been made to expedite the manufacture of fittings complying with this specification for use with both gas and electricity on existing standards, and designed, so far as practicable, in a form to allow of adaptation of existing lighting units.

The Minister hopes that the installation of this type of street lighting will have a considerable effect in promoting the comfort of the pedestrian and securing safety on the roads, and he trusts that Lighting Authorities will take steps to install it as supplies of the necessary fittings become available.

I am, Sir,

Your obedient Servant,

(Signed) F. C. JOHNSON.

The Clerk of the County Council,
The County Clerk,
The Town Clerk,
The Clerk of the District Council.

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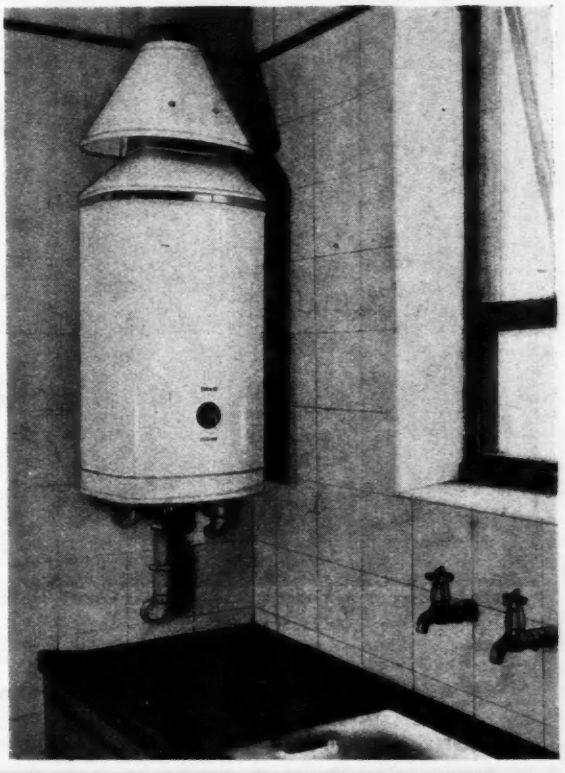

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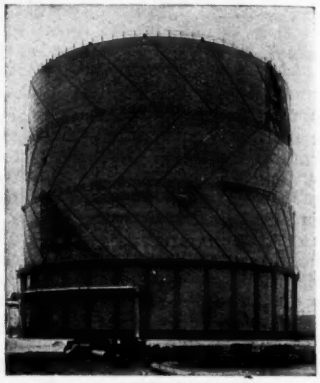

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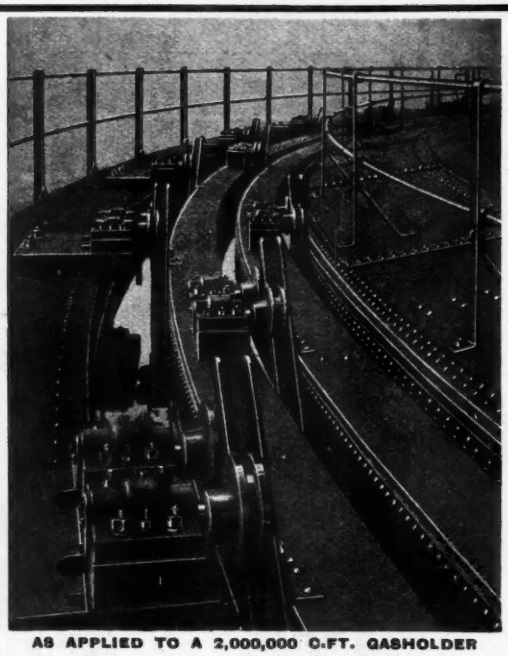

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Current Sales of Gas Products

The London Market

Feb. 12.

To-day's values of tar products in the London market are as follows:

Pitch about 35s. per ton f.o.b.

Creosote about 5d. per gallon.

Refined tar 3¼d. to 4d.

Toluole is now controlled by the Ministry of Supply Order No. 1, which fixes the maximum price at which this material may be sold.

Pure benzole about 1s. 10d.

95/160 solvent naphtha about 1s. 11d.

90/160 pyridine 15s. to 16s.

All per gallon naked.

Refined naphthalene crystals about £20 per ton in bags.

All *ex* makers' works.

The Provinces

Feb. 12.

Crude Gas-Works Tar, 19s. 3d. to 24s. 3d.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 32s. 6d. to 35s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 32s. 6d. to 35s.* Toluole, naked, North, 1s. 9½d. (Controlled by the Ministry of Supply Order No. 1, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 9d. to 9½d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 9d. Heavy naphtha, North, 1s. 4½d. to 1s. 5½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4¾d. to 5d.; Scotland, 4¾d. to 5d.; low gravity, 4¼d. to 5d. Carbolic acid, 60's. 3s. 3d. to 3s. 4½d. Naphthalene, £15 to £20. Salts, 75s. to 85s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal. Heavy oil: Unfiltered anthracene oil, (min. gr. 1,080), 5¼d. to 5½d.; filtered heavy oil (min. gr. 1,080), 5¾d. to 6d.; heavy anthracene oil gr. less than 1,080, 6d. to 6¼d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls, whatever they may be.

Scotland

GLASGOW, Feb. 10.

No material alteration has taken place in market conditions during the week. New business is no more than normal, but prices are well held in most departments.

Crude gas-works tar.—The actual value remains at round 34s. to 36s. per ton *ex* works in bulk.

Pitch.—Quotations show an advance to 27s. 6d. to 30s. per ton f.o.b. for export and about 27s. 6d. per ton *ex* works in bulk for home trade.

Refined tar.—Home price is maintained at 3¾d. to 4d. per gallon, but at this time of the year very little business is conducted. Export demand is fair with value at 2¼d. to 2¾d. per gallon, both naked at makers' works.

Creosote oil.—Fair quantities have been changing hands and prices are as follows: Specification oil, 5d. to 5¼d. per gallon; low gravity, 6d. to 6¼d. per gallon; neutral oil, 5½d. to 5¾d. per gallon; all *ex* works in bulk.

Cresylic acid.—Enquiries are not plentiful but makers' quotations are unchanged at round the following: Pale, 97/99% 2s. 2d. to 2s. 4d. per gallon; dark, 97/99%, 1s. 10d. to 2s. per gallon; pale, 99/100%, 2s. 6d. to 2s. 9d. per gallon; all *ex* works in buyers' packages.

Crude naphtha continues to be valued at about 7d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 8d. to 1s. 9d. per gallon and 90/190 heavy naphtha is about 1s. 4d. to 1s. 5d. per gallon.

Motor benzole is called 1s. 6½d. to 1s. 7d. per gallon.

Pyridine.—Prices are nominal at 15s. to 16s. per gallon for 90/160 grade and 17s. to 18s. per gallon for 90/140 grade.

Contracts Advertised

Coal.
Buxton Gas Department. [p. 370.]

Meters and Repairs.
Manchester Gas Committee. [p. 370.]

Purifiers.
Chesterfield Gas Department. [p. 370.]

Overseas Opportunities

Johannesburg

Street Light Fittings.—H.M. Trade Commissioner at Johannesburg reports that the City of Johannesburg Stores Department is calling for tenders (Contract No. 493) for the supply and delivery of street lighting fittings. Tenders endorsed "Contract No. 493, Street Lighting Fittings," should be addressed to the Town Clerk, Municipal Offices, Johannesburg, by whom they will be received up to noon on Saturday, March 16, 1940. (Ref. T. 15896/40.)

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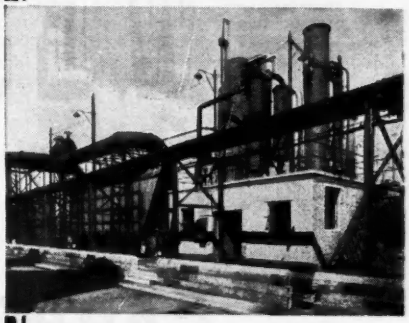

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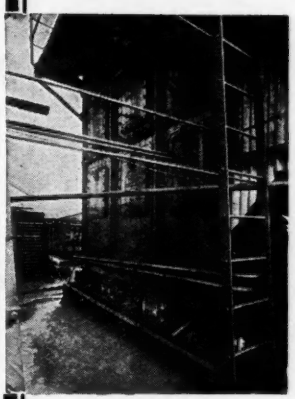

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GAS STOCKS AND SHARES

The activity in home rails was intensified last week on the announcement of the agreement between the Government and the Railway Companies. Substantial rises in price took place and despite a considerable amount of profit-taking the tone was very firm at the close. On the other hand, some heavy selling orders during the week led to reactions in British Funds, and the sharp rally which took place on Friday came too late to offset previous losses. 2½% Consols opened the week at 74¼ and were at one time changing hands at 72¼ eventually closing at 73. There was no expansion of business in the industrial market though the tone remained firm. Rubber shares hardened on a rise in the price of the commodity.

More activity was noticeable in the Gas Market last week, which is not unusual at this time of the year after a number of stocks have gone ex-dividend, though the volume of business is, of course, much below pre-war dimensions.

Apart from the ex-dividend reductions, the few changes in price were mostly in an upward direction, and among "ordinaries" South Metropolitan advanced 2 points to 66½ and Plymouth 2 to 102½; the only reaction occurred in Imperial Continental which closed a point down at 79½. That the demand for fixed-interest stocks continues is evidenced by the further upward movements in these securities as will be seen in the table below. No movements of importance occurred on the Provincial Exchanges or in the Supplementary List.

The Directors of the South Metropolitan Gas Company are recommending a final ordinary dividend of 2%, making 4½% for the year 1939 as compared with 5½% for 1938. The stock is now changing hands at round about 66, at which price the yield on the current dividend works out at £6 16s. 4d.%.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 9.	Rise or Fall on Week.
1,767,439	Sept. 4	8	8	Alliance & Dublin Ord. ...	115—125	...
374,000	Dec. 27	4	4	Do. 4 p.c. Deb. ...	80—90	...
877,576	Nov. 6	5	5	Asscd. Gas & Water U'd'ts Ord.	14/6—16/6	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	17/—19/—	...
535,545	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	15/—17/—	...
318,730	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	13/6—15/6	...
750,000	Sept. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	80—85	...
560,070	Aug. 21	7	7	Barnet Ord. 7 p.c.	110—120	...
300,000	Oct. 9	1/9§	1/4§	Bombay, Ltd.	19/6—20/6	...
181,185	Aug. 21	9½	9½	Bournemouth Sliding Scale ...	147—152	...
690,526	,,	7	7	Do. 7 p.c. max. ...	120—125	...
493,960	,,	6	6	Do. 6 p.c. Pref. ...	115—120	...
50,000	Dec. 18	3	3	Do. 3 p.c. Deb. ...	68—73	...
362,025	,,	4	4	Do. 4 p.c. Deb. ...	90—95	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...
357,900	Aug. 21	7½	7½	Brighton, &c., 6 p.c. Con. ...	105—110	...
659,955	,,	6½	6½	Do. 5 p.c. Con. ...	100—105	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref. ...	100—105	...
855,000	Sept. 18	8	7	British Ord.	90— 95	...
100,000	Dec. 18	7	7	Do. 7 p.c. Pref.	120—125	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb.	73—78	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb.	98—103	...
100,000	22 May '33	6	4	Cape Town, Ltd.	½—¾	...
100,000	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref.	½—¾	...
150,000	Dec. 18	4½	4½	Do. 4½ p.c. Deb.	55—65	...
626,860	Jan. 29	6	5⅞	Cardiff Con. Ord.	100—105	...
237,860	Dec. 18	5	5	Do. 5 p.c. Red. Deb. ...	95—100	...
98,936	Oct. 9	2/—	2/—	Colombo Ord.	1½—1¾	...
24,510	,,	1/4½	1/4½	Do. 7 p.c. Pref.	20/6—22/6	...
739,453	Sept. 27	—/11.48	—/11.48	Colonial Gas Assn. Ltd. Ord. ...	15/—17/—	...
296,144	,,	1/3.30	1/3.30	Do. 8 p.c. Pref.	20/6—22/6	...
1,775,005	Jan. 29	4	2	Commercial Ord.	45—55	...
140,000	Aug. 21	4	4	Do. 4 p.c. Red. Pref. ...	88—93	...
620,000	Dec. 11	3	3	Do. 3 p.c. Deb.	58—63	...
286,344	Aug. 21	5	5	Do. 5 p.c. Deb.	92—97	...
200,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	94— 99	...
807,560	July 31	7	7	Croydon sliding scale	100—105	...
644,590	,,	5	5	Do. max. div.	81—86	...
620,365	Dec. 27	5	5	Do. 5 p.c. Deb.	97—102	...
1,000,660	Aug. 21	5	5	Dudley, Brierley Hill & Dist. Ord.	100—105	...
82,275	,,	5	5	Do. 5 p.c. Con. Pref. ...	95—100	...
79,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	94—99	...
239,000	Jan. 29	5	88/6	East Hull Ord. 5 p.c.	80—90	...
187,215	Aug. 21	6	5¾	East Surrey Ord. 5 p.c. ...	95—100	−3
176,211	Dec. 18	5	5	Do. 5 p.c. Deb. ...	90—100	...
250,000	Nov. 13	8	4	Gas Consolidation Ord. 'B' ...	14/—17/—	...
250,000	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	16/—18/—	...
19,152,410	Jan 29	5§	3§	Gas Light & Coke Ord. ...	16/9-17/9a	...
2,600,000	,,	3½	3½	Do. 3½ p.c. max.	60—65	+1
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref. ...	82—87	+1
2,993,000	Jan. 2	3§	3§	Do. 3§ p.c. Red. Pref. ...	83—88	...
8,602,497	Nov. 27	3	3	Do. 3 p.c. Con. Deb. ...	75—80	...
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb. ...	102—107	...
1,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	100—105	...
700,000	Sept. 4	3½	3½	Do. 3½ p.c. Red. Ded. ...	86—91	+1
270,466	July 31	6	6	Harrogate New Cons.	95—100	...
157,500	Mar. 20	‡1/—	‡1/—	Hong Kong and China Ord. ...	½—¾	...
5,600,000	Oct. 23	12	4	Imperial Continental Cap. ...	77—82	−1
172,810	Jan. 29	3½	3½	Do. 3½ p.c. Red. Deb. ...	80—85	...
63,480	Dec. 18	3	3	Maidstone 3 p.c. Deb.	55—60	...
45,000		†10	†8	Malta & Mediterranean Metropolitan (of Melbourne) ...	92—102	...
392,000	Oct. 2	5½	5½	5½ p.c. Red. Deb.	95—100	...
231,977	Aug. 21	5	5	M.S. Utility 'C' Cons.	75—80	...
968,658	,,	4	4	Do. 4 p.c. Cons. Pref. ...	75—80	...
390,076	Dec. 18	4	4	Do. 4 p.c. Deb. ...	72—82	...
148,955	Dec. 18	5	5	M.S. Utility 5 p.c. Deb. ...	95—100	...
125,000	Jan. 2	3½	3½	Do. 3½ p.c. Red. Bds. ...	90—95	...
675,000	Nov. 6	†3	†4	Montevideo, Ltd.	50—60	...
250,000	Aug. 21	7½	7½	North Middlesex 6 p.c. Con. ...	105—115	...
396,160	Jan. 29	5	5	Northampton 5 p.c. max. ...	90—95	...
300,000	Nov. 6	†7	9	Oriental, Ltd.	118—128	...
468,537	Dec. 11	8	7	Plymouth & Stonehouse 5 p.c.	100—105	+2
621,667	Feb. 5	8½	8½	Portsmouth & Gosport Cons.	108—113*	−3
241,446	,,	5	5	Do. 5 p.c. max.	80—90*	...
73,350	,,	5	5	Do. 5 p.c. Pref.	87—92*	−1
75,000	,,	4	4	Do. 4 p.c. Pref.	75—80*	...
114,000	Feb. 5	5	5	Preston 5 p.c. Pref.	88—93*	−2
247,966	Dec. 18	4	4	Primitiva 4 p.c. Cons. Deb. ...	93—98	...
625,959	Jan. 15	4	4	Do. 4 p.c. Red. Deb. ...	91—96	...
15,000	Sept. 4	6	6	San Paulo 6 p.c. Cum. Pref. ...	7½—8½	...
441,275	Oct. 9	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	16/6—18/6	...
460,810	Oct. 2	—/10⅝	—/10⅝	,, ,, 4½ p.c. Cum. Pref. ...	17/—19/—	...
133,201	Aug. 21	5	8½	Shrewsbury 5 p.c. Ord. ...	107—117	...
9,000	June 5	‡4	‡4	South African Ord.	4—5	...
1,996,297	Aug. 21	1/2⅛	1/2⅛	South East'n Gas Cn. Ld. Ord.	15/6—17/6	...
1,000,000	,,	—/10⅛	—/10⅛	Do. 4½ p.c. Red. Cum. Pref.	17/—19/—	...
769,191	,,	4	4	Do. 4 p.c. Cum. Pref. ...	14/6—16/6	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
6,709,895	July 31	6	5	South Met. Ord.	64—69	+2
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	102—107	+2
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	75—80	...
1,895,445	Dec. 27	3	3	Do. 3 p.c. Deb.	65—70	...
1,000,000	Jan. 15	5	5	Do. 5 p.c. Red. Deb. ...	100—105	...
600,000	,,	3§	3§	Do. 3§ p.c. Red. Deb. ...	92—97	...
1,543,795	Feb. 5	6	3	South Suburban Ord. 5 p.c. ...	72—77*	...
512,925	,,	5	5	Do. 5 p.c. Pref.	88—93*	−2
500,000	,,	4	4	Do. 4 p.c. Pref.	78—83*	...
250,000	,,	3§	3§	Do. 3§ p.c. Red. Pref. ...	84—89*	−1
888,587	Dec. 11	5	5	Do. 5 p.c. Deb.	98—103	...
250,000	,,	4	4	Do. 4 p.c. Deb.	80—85	+3
200,000	July 31	3	3½	Do. 3½ p.c. Red. Deb. ...	85—90	...
427,859	Sept. 18	1/2§	9§	S. Western Gas & Water Ord.	13/—15/—	...
160,523	Oct. 9	—/10½	—/10§	Do. 4½ p.c. Red. Cum. Pref.	17/6—19/6	...
110,000	Dec. 18	4	4	Do. 4 p.c. Red. Deb. ...	90—95	...
750,541	Feb. 5	5½	5½	Southampton Ord. 5 p.c. ...	73—78*	−2
148,836	Dec. 27	4	4	Do. 4 p.c. Deb.	75—80	...
350,000	July 31	5½	5½	Swansea 5½ p.c. Red. Pref. ...	95—100	+2½
200,000	Dec. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—100	...
1,076,490	July 31	6½	6½	Tottenham and District Ord....	90—95	...
409,835	,,	5½	5½	Do. 5½ p.c. Pref.	100—105	...
62,235	,,	5	5	Do. 5 p.c. Pref.	90—95	...
453,380	Dec. 11	4	4	Do. 4 p.c. Deb.	80—85	...
1,247,505	Oct. 23	6	4	U. Kingdom Gas Cor. Ord. ...	13/—15/—	...
1,085,952	Nov. 20	4½	4½	Do. 4½ p.c. 1st Cum. Pref. ...	14/6—16/6	...
772,709	,,	4	4	Do. 4 p.c. 1st Red. Cum. Pf.	14/6—16/6	...
745,263	Dec. 18	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pf.	12/6—14/6	...
1,093,656	Sept 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	85—90	...
378,106	Mar. 6	7	7	Uxbridge, &c., 5 p.c.	90—100	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	95—105	...
1,371,138	Feb. 5	6½	3½	Wandsworth Consolidated ...	83—88*	−2
2,525,768	,,	4	4	Do. 4 p.c. Pref.	81—86*	...
1,343,964	Dec. 18	5	5	Do. 5 p.c. Deb.	98—103	...
383,745	,,	4	4	Do. 4 p.c. Deb.	80—85	...
400,000	,,	3§	3§	Do. 3§ p.c. Red. Deb. ...	90—95	...
558,342	Jan. 29	6§	6	Watford and St. Albans Ord. ...	95—100	...
200,000	,,	5	5	Do. 5 p.c. Pref.	87—92	...
200,000	,,	5½	5½	Do. 5½ p.c. Pref.	92—97	...
200,000	,,	4	4	Do. 4 p.c. Red. Pf. (1973/8)	85—90	...
100,000	,,	33/4§	4	Do. 4 p.c. Red. Pf. (1959)	93—98	...
200,000	Dec. 11	3¼	3½	Do. 3½ p.c. Red. Deb. ...	83—88	...

a.—The quotation is per £1 of Stock. * Ex. Div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Contd.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations Feb. 9.	Rise or Fall on Week.
202,152	Sept. 4	5	5	Ascot Ord.	80—90	...
128,182	Dec. 27	5	5	Do. 5 p.c. Pref. ...	88—93	...
31,035	Aug. 21	-/4⅛	-/4⅛	Associated Utilities 4 p.c. Pref.	15/—17/-	...
100,000	Dec. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
17,000	Aug. 21	8	8	Bognor Orig. Ord. 'A' ...	105—115	...
62,210	,,	8	8	Do. New Add. 'A' ...	105—115	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	100—110	...
37,440	Jaa. 29	10	10	Cam. Univ. & Town 10 p.c. max.	110—120*	...
125,970	,,	7	7	Do. 7 p.c. max.	90—100*	...
39,025	,,	5	5	Do. 5 p.c. max.	80—90*	...
96,410	Jan. 29	4½	4½	Cardiff 4½ p.c. Pref.	90—95*	...
55,520	July 31	6	6	Colchester 6 p.c. Pref. ...	95—100	...
90,550	Sept. 18	5	5	Do. 5 p.c. Deb. ...	100—105	...
150,000	July 31	4	4	Croydon 4 p.c. Pref.	70—75	...
130,000	Dec. 27	4	4	Do. 4 p.c. Deb.	80—85	...
65,000	Aug. 21	7½	7½	Eastbourne 'A' 5 p.c.	105—115	...
198,000	,,	6	6	Do. 'B' 3½ p.c.	90—100	...
112,312	,,	5	5	Do. 5 p.c. Pref.	90—95	...
180,000	Dec. 18	5	5	Do. 5 p.c. Deb.	95—105	...
120,500	Aug. 10	7½	7½	Exeter New Ord. (£10) ...	10—12	...
24,000	Aug. 21	8½	8½	Gt. Yarmouth 8½ p.c. max. (£30)	15—20	...
59,408	,,	7½	7½	Do. 7½ p.c. max. (£30) ...	10—15	...
31,160	Dec. 11	5½	5½	Do. 5½ p.c. Deb.	102—107	...
182,600	Sept. 4	9	8	Guildford Cons.	110—120	...
84,055	,,	5	5	Do. 5 p.c. Pref.	90—95	...
98,250	Dec. 11	5	5	Do. 5 p.c. Deb.	90—95	...
156,600	Aug. 21	7	7	Hampton Court Cons. ...	100—110	...
86,046	June 19	‡4½	‡5	Holyh'd&N.W.G.&W.Cpn.Ord.	13/6—15/6	...
80,000	Aug. 21	4	4	Lea Bridge 4 p.c. Pref.	65—75	...
40,000	,,	6	6	Do. 6 p.c. Pref.	105—115	...
94,876	Dec. 18	4	4	Do. 4 p.c. Deb.	75—80	...
73,620	Sept. 18	8½	8½	Luton Cons. 'A'	115—125	...
107,960	Sept. 18	5½	4	Mid Kent Ord. (£10) ...	7½— 8½	...
230,940	Feb. 5	10	10	Oxford & District Ord. ...	135—145*	...
47,112	,,	5	5	Do. 5 p.c. Pref.	85—90*	-2½
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	100—105*	...
126,193	Oct. 30	7½	7½	Peterborough Ord.	140—150	...
64,990	Sept. 18	7½	7	Redditch Ord.	100—110	...
166,850	July 31	8	8	Romford Ord.	110—120	...
60,000	,,	4	4	Do. 4 p.c. Pref.	85—90	...
44,080	Sept. 18	5	5	Do. 5 p.c. Deb.	95—100	...
25,570	July 31	5½	5½	Rugby 5½ p.c. Pref.	95—105	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	100—105	...
42,750	Dec. 11	5½	5½	Do. 5½ p.c. Deb.	103—108	...
110,950	Aug. 21	8	8	Ryde Ord.	110—120	...
270,086	Sept. 4	7	7	Slough Ord.	100—110	...
21,000	Dec. 11	5	5	Do. 5 p.c. Deb.	92—97	...
28,872	Nov. 6	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	14/—16/-	...
28,866	Sept. 18	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	14/—16/-	...
117,228	Aug. 21	7	5	Swindon Cons.	70—80	...
60,425	Dec. 18	5	5	Do. 5 p.c. Deb.	92—97	...
64,380	,,	5	5	Torquay & Paignton 5 p.c. Pref.	82—87	...
130,000	Aug. 21	8	5	Wakefield Ord.	85—95	...
81,650	,,	5	5	Do. 5 p.c. max.	75—80	...
82,000	Jan. 29	6	6	Weymouth Ord.	82—87	-½
273,626	Aug. 21	7	7	Wolverhampton Cons. Ord. ...	115—125	...
98,384	,,	6	6	Do. 6 p.c. Pref.	105—115	...
160,000	Dec. 18	5½	5½	Do. 5½ p.c. Red. Deb. ...	100—105	...
106,490	Aug. 21	5½	5½	Wrexham Ord.	70—80	...
90,000	Dec. 18	5	5	York 5 p.c. Red. Deb.	95—100	...
133,640	July 31	6½	6	Yorktown (Cam.) 5 p.c. Cons.	80—90	...
120,000	,,	5	5	Do. 5 p.c. Pref.	85—95	...
35,000	Dec. 18	5½	5½	Do. 5½ p.c. Deb.	103—108	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 9	Rise or Fall on Week
347,756	July 31	6	5	Bath Cons.	101—105	...
1,667,250	Feb. 5	5	5	Bristol, 5 p.c. max.	95—99*	-1½
120,420	Dec. 18	4	4	Do. 1st 4 p.c. Deb.	97—100	...
415,250	,,	4	4	Do. 2nd 4 p.c. Deb. ...	97—100	...
328,790	,,	5	5	Do. 5 p.c. Deb.	113—116	...
274,000	July 31	5	5	Newport (Mon.) Ord.... ...	93—95	...
13,200	Sept. 4	8⅝	7	Pontyp'l Gas & W. 10 p.c. 'A'	12—13	...
13,600	,,	6	5	Do. 7 p.c. 'B'	10½—11	...
40,000	,,	6	5	Do. 7 p.c. 'C'	10½—11	...
140,778	July 31	5	5	Weston-super-Mare Cons. ...	93—98	...
64,338	Dec. 27	4	4	Do. 4 p.c. Deb.	90—95	...
33,340	,,	7⅛	7⅛	Do. 7⅛ p.c. Deb.	140—150	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 9	Rise or Fall on Week
157,150	Feb. 5	5	6½	Chester 5 p.c. Ord.	98—101*	-2
92,500	Dec. 18	4	4	Do. 4 p.c. Pref.	80—84	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	85—88	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—99	...
2,167,410	Aug. 21	6	6	Liverpool 5 p.c. Ord.	101—103	...
245,500	Dec. 18	5	5	Do. 5 p.c. Red Pref. ...	95—100	+1
306,083	July 17	4	4	Do. 4 p.c. Deb.	99—101	...
106,280	Feb. 5	10	8	Preston 'A' 10 p.c.	171—181*	-3
188,219	,,	7	7	Do. 'B' 7 p.c.	123½—133½*	-2½

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 9	Rise or Fall on Week
122,577	Aug. 21	7	7	Blyth 5 p.c. Ord.	115—120	...
732,000	Aug. 21	3	3	Hartlepool G. & W. Co. & New	65—66	...
2,430,267	Feb. 5	5	5 7/10	Newcastle & Gateshead Con.	19/3—19/9*a	--/3
682,856	,,	4	4	Do. 4 p.c. Pref.	86½—87½*	-1½
776,706	Dec. 27	3½	3½	Do. 3½ p.c. Deb.	78—80	...
277,285	April 24	5	5	Do. 5 p.c. Deb. '43 ...	98—103	...
332,351	Feb. 5	6	6	Sunderland 6 p.c. max. ...	106—107*	-2

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 9	Rise or Fall on Week
542,270	Aug. 10	9	6	Derby Con.	105—110	...
55,000	Dec. 18	4	4	Do. 4 p.c. Deb.	98—103	...
20,000	June 19	5	5	Long Eaton 5 p.c. Pref. ...	9—11	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	100—105	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Feb. 9	Rise or Fall on Week
10,000	Aug. 21	10	10	Great Grimsby 'A' Ord. ...	170—180	...
6,500	,,	10	10	Do. 'B' Ord. ...	170—180	...
79,000	,,	10	10	Do. 'C' Ord. ...	160—170	...
1,806,339	Feb. 20	6½	6½	Sheffield Cons.	123—126	...
95,000	Jan. 3	4	4	Do. 4 p.c. Deb.	98—100	...

a The quotation is per £1 of Stock.
* Ex. div. ‡ For year.

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